

Safety at sea: understanding the role of
the psychological contract in seafarers'
safe and unsafe behaviour using
affective events and ego depletion
theories

Claire Helen Pekcan

School of Management
Royal Holloway, University of London

Doctor of Philosophy

Declaration of authorship

I, Claire Helen Pekcan, hereby declare that this thesis and the work presented in it is entirely my own. Where I have consulted the work of others, this is always clearly stated.



Signed:

Date: 15th February 2017

Abstract

One of the intractable problems facing society is how to ensure workers are safe as well as productive. Yet, knowing where to look for answers poses a considerable challenge to safety researchers. Consequently, employee safety behaviour is a relatively under-researched topic. This thesis takes a novel approach and applies psychological contract theory, which proposes that employees' workplace behaviours are a function of the reciprocal obligations that arise when promises are made, paid for, and are subsequently honoured or broken.

A dual-pathway model is tested in which the motivational and attentional resources of individuals (operationalised as psychological contract violation and cognitive failure) are hypothesised to explain the independent relationships of fulfilment and breach with a range of safe, unsafe and unhealthy behaviours. The two pathways draw on Affective Events and Ego Depletion theories.

The research is conducted with seafarers working for two merchant shipping organisations registered in Denmark and the UK. It consists of a longitudinal survey with 750 and 629 respondents at two time points respectively, and a 14-day daily diary with 50 participants in total.

The two-wave study provides broad support for the dual-pathway model. In cross-sectional and change score analyses of breach, disaffected individuals are more inclined to rule-violating behaviour, and, those whose attentional resources are depleted, less likely to engage in pro-safe behaviours. In cross-section, greater fulfilment is associated with less violation and with more motivation to engage in pro-safe behaviours, but not with fewer attentional lapses. Conversely, longitudinal analyses suggest that increases in fulfilment are associated with *increases* in attentional disruption and safety behaviour withdrawal.

The second, diary study investigates the dynamic nature of exchanges and the implications these have for day-to-day experiences and behaviour. Findings at the daily level differed to the survey, raising questions about how safety behaviours unfold. Implications and contributions are discussed.

Acknowledgements

A PhD is a journey of discovery, excitement and wonder, but also one that entails dead-ends, setbacks and sacrifice. Above all, it is one that is undertaken alone, but without the support of some very special people, it would never be completed. I should like to acknowledge the following people who have helped me complete my PhD journey and to whom I am eternally grateful for their encouragement, sympathy, support, practical help and good advice.

To my supervisor Professor Neil Conway, I thank you for your enthusiasm, dedication and integrity with which you undertook my supervision. You have been my inspiration, mentor, motivator, slave driver and oracle. Your words of praise and encouragement were what kept me going. I have huge admiration for your abilities and work and I feel tremendously privileged to have studied under your guidance.

To my second supervisor Professor Gillian Symon, I thank you for your level-headedness, reassurance, compassion and sincerity. You always had practical advice on how to succeed and kept me pointing in the right direction whenever a storm was brewing.

To my colleague and friend, Professor Mike Barnett, I thank you for inspiring me to undertake a PhD in the first place. Without your support, I would have never succeeded. I am ever thankful to you for taking on my work responsibilities so that I could take the summers off to write and for all the coffee and chats that helped me keep calm and carry on. To all my other colleagues at Warsash Maritime Academy, thank you for your forbearance in dealing with the fall out of my absences.

I was lucky enough to have the help of some outstanding people in the maritime industry and who championed my project and me. My very special thanks go to Tommy Olofsen whose courage to let me loose in his organisation was an unprecedented leap of faith in my abilities and my ideas. My eternal gratitude to Bente Boa too, without whose help and friendship I would not have completed. My thanks to Neil Dulling and Captain Loney; I know my research contributed to your workload considerably, but you helped me nevertheless uncomplainingly.

To all my friends and family, thank you for always being there for me. You have seen me through the ups and downs. I want to give particular thanks to my sister Julie, my Uncle Edwin, my brother-in-law Malcolm and my closest friends Maggie, Becs, Sue, Paula, Jackie, Debbie and Gillian. You hid your incredulity at my madness and encouraged me to go on when my resolve was wavering. Thank you also to Dr Suja Chacko who blazed the trail so that I might follow, Dr Peter Levison and Dr Katja Samuel who really understood what it was all about. Thank you Augusta Wolff for helping me with my own emotion regulation.

Last but not least, my thanks to all the hundreds of seafarers who took part in my research. You risk your lives to bring us everything that sustains and entertains us from apples to TVs. You do this without much recognition of your sacrifice and commitment. I hope my research will contribute in some small way to making your working lives better.

Contents

Abstract	3
Acknowledgements	4
List of figures	7
List of tables	8
CHAPTER 1. INTRODUCTION TO THESIS	10
1.1 Aims	10
1.2 Background and contributions	11
1.3 Chapter structure	14
1.4 Summary	15
CHAPTER 2. WORK BEHAVIOUR IN SAFETY CRITICAL SETTINGS	16
2.1 Introduction	16
2.2 Workplace safety performance	16
2.3 Taxonomies of safety behaviours	20
2.4 Introduction to the causes of safety behaviour	29
2.5 Individual causes of safety behaviour	30
2.6 Situational causes of safety behaviour	36
2.7 Conclusions	51
CHAPTER 3. THE PSYCHOLOGICAL CONTRACT AS AN EXPLANATORY FRAMEWORK FOR EMPLOYEE BEHAVIOUR	55
3.1 Introduction	55
3.2 The psychology of the employment relationship	56
3.3 The unfolding psychological contract and behaviour	67
3.4 Mediating mechanisms between fulfilment, breach and behaviour	78
3.5 Conclusions	86
CHAPTER 4. RESEARCH FRAMEWORK	89
4.1 Issues to be addressed by this research	89
4.2 Research questions	89
4.3 Link between research questions and empirical studies	94
4.4 Summary	95

CHAPTER 5. A LONGITUDINAL SURVEY OF PSYCHOLOGICAL CONTRACTS AND SAFETY BEHAVIOUR	97
5.1 Introduction	97
5.2 Conceptual framework	98
5.3 Method.....	119
5.4 Results	138
5.5 Discussion of results	174
5.6 Limitations and further research	181
5.7 Summary.....	183
CHAPTER 6. A DIARY STUDY OF PSYCHOLOGICAL CONTRACT EVENTS AND SAFETY BEHAVIOUR	186
6.1 Introduction	186
6.2 Research design	186
6.3 Research framework.....	190
6.4 Method.....	198
6.5 Results	202
6.6 Discussion of results	219
6.7 Limitations of the study.....	224
6.8 Summary.....	225
CHAPTER 7. DISCUSSION AND CONCLUSIONS	227
7.1 Introduction	227
7.2 Key findings in relation to aims.....	227
7.3 Methodological contribution.....	242
7.4 Limitations and recommendations.....	243
7.5 Future research.....	244
7.6 Implications for practice	247
7.7 Conclusion.....	249
References	252
Appendix A: Factor scores and item loadings.....	286
Appendix B: Null and unconditional models.....	288
Appendix C: Survey questionnaire	290
Appendix D: Daily diary	309

List of figures

Figure 3.1 Traditional and affect-driven models of performance after Weiss and Cropanzano (1996).....	81
Figure 4.1 Path model depicting latent constructs and research questions	90
Figure 5.1 Theoretical model and hypotheses.....	99
Figure 5.2 Diagram of the paths connecting an independent, mediator and dependent variable (adapted from Zhao et al, 2010).....	137
Figure 5.3 Model B I: The partially-mediated effects of psychological contract fulfilment and breach on outcomes at Time I.....	150
Figure 5.4 Model B I: The partially-mediated effects of psychological contract fulfilment and breach on outcomes at Time II.....	151
Figure 5.5 Interaction of breach and prevention self-regulatory focus on feelings of violation (Time I data).....	158
Figure 5.6 Moderation of the effects of violation on unsafe behaviour.....	160
Figure 5.7 Moderation of the effects of cognitive failure on safety citizenship towards the organisation.....	161
Figure 5.8 Predicting change over time.....	163
Figure 5.9 Structural model for the motivation pathway and in-role safety behaviour.	166
Figure 6.1 Hypothesised model and associated research questions at the within-person level.....	191
Figure 7.1 Summary of significant structural relationships between antecedents, mediators and outcomes from cross-sectional survey.....	228
Figure 7.2 Significant change scores from longitudinal study (Time I to Time II = 6 months)	229
Figure 7.3 Significant within-person coefficients from diary study (Level 1).....	229

List of tables

Table 3.1 Summary of descriptions and definitions of psychological contracts from different paradigmatic perspectives.....	57
Table 4.1 Research questions addressed by empirical studies	95
Table 5.1 Sample demographic statistics.....	122
Table 5.2 Summary statistics of measured variables.....	140
Table 5.3 Interscale correlations of study variables	141
Table 5.4 Goodness-of-fit indices for measurement and structural models	144
Table 5.5 Direct and total effects of fulfilment and breach at Time I and Time II (standardised path estimates).....	148
Table 5.6 Motivation mediation pathway: indirect path estimates (bootstrapped) with 95% confidence intervals of fulfilment and breach on health and safety behaviours via violation.....	153
Table 5.7 Attention mediation pathway: indirect path estimates (bootstrapped) with 95% confidence intervals for health and safety behaviours via cognitive failure	155
Table 5.8 Indirect path estimates (bootstrapped) with 95% confidence intervals for breach on accident propensity via unsafe behaviour	156
Table 5.9 Goodness-of-fit indices for structural models where self-regulatory focus moderates breach.....	157
Table 5.10 Moderating effects of self-regulatory focus at work on breach.....	158
Table 5.11 Goodness-of-fit indices for structural models where emotion regulation strategy moderates violation and cognitive failure	159
Table 5.12 Moderating effects of emotion-regulation strategy on violation and cognitive failure ..	160
Table 5.13 Goodness-of-fit indices for longitudinal measurement models.....	165
Table 5.14 Goodness-of-it indices for longitudinal structural models	166
Table 5.15 Path estimates (standardised) of lagged relationships between variables	167
Table 5.16 Change score (standardised) analyses for predictors to mediators ($X \rightarrow M$)	168
Table 5.17 Change score (standardised) analyses for violation and cognitive failure to psychological well-being, pro-safe behaviours, unsafe and unhealthy behaviours ($M \rightarrow Y$)	169
Table 5.18 Indirect path estimates (unstandardised) of breach on outcomes via violation and cognitive failure.....	171
Table 5.19 Summary of results by hypotheses.....	172
Table 6.1 Means, SDs and intercorrelations of all study variables.....	205
Table 6.2 Direct effects of breach and fulfilment on pleasant and unpleasant mood, violation and cognitive failure.....	207
Table 6.3 Direct effects of violation on cognitive failure	208
Table 6.4 Direct effects of pleasant and unpleasant mood on cognitive failure	209

Table 6.5 Direct effects of breach, violation and unpleasant mood on cognitive failure	209
Table 6.6 Indirect effect of breach events via unpleasant mood on cognitive failure (Level 1)	210
Table 6.7 Direct effects of breach, fulfilment and violation on outcomes	211
Table 6.8 Indirect effects of breach via violation on outcomes (Level 1).....	212
Table 6.9 Direct effects of breach, fulfilment and daily mood on outcomes	212
Table 6.10 Indirect effects of breach via unpleasant mood on outcomes (Level 1).....	212
Table 6.11 Direct effects of pleasant, unpleasant mood and cognitive failure on outcomes	214
Table 6.12 Indirect effects of unpleasant mood via cognitive failure on outcomes (Level 1)	214
Table 6.13 Moderating effects of antecedent- and response-focussed emotion regulation on breach (Level 1)	215
Table 6.14 Moderating effects of antecedent-focussed emotion regulation on violation and cognitive failure (Level 1).....	216
Table 6.15 Moderating effects of response-focussed emotion regulation on violation and cognitive failure (Level 1).....	217
Table 6.16 Summary of support for hypotheses.....	218
Table 7.1 Summary of findings across studies in respect of violation, cognitive failures and behavioural outcomes	235

Chapter 1. Introduction to thesis

This research addresses one of the most important and enduring problems facing industrialised societies: how to ensure that workers work safely both for their own well-being and for the health and safety of those around them. This is a complex issue in that it is often difficult, both morally and practically, to disentangle the employer's behaviour from the employee's behaviour to ascertain where to make changes to improve workplace safety and reduce accidents. This thesis aims to take a different perspective on the problem by examining the *relationship* between employer and employee and its influence on both safe and unsafe behaviour. Further, it proposes and aims to test the psychological contract as a focal theory for understanding employees' willingness and capacity to work safely through its impact on their motivation and attention.

This chapter provides an introduction to this document. It first outlines the aims of this thesis. A discussion of the theoretical background to the research topic follows whereupon it explains the contribution that this body of work makes to the fields of organizational psychology and safety science. Lastly, it sets out the chapter structure for the remainder of the document.

1.1 Aims

This research has two main aims.

The primary aim is to use psychological contract theory to explain the on-going variation in employees' safety behaviour. The full spectrum of safety behaviour is considered from safety compliance through safety citizenship to unsafe behaviour and accidents. It examines the employment relationship from the employee's perspective. By doing so, this thesis aims to show that psychological contract fulfilment and breach can help explain when and how employees alter their contribution to their organisation's safety performance.

The second aim of this research is to empirically examine psychological contract theory as a theory of workplace behaviour and two mediating pathways that connect the psychological contract to safety outcomes. The first pathway draws on Affective Events Theory and suggests that it is the affect-inducing properties of fulfilment and breach that motivate individuals to alter their safety contribution. The second pathway uses Ego Depletion Theory, which proposes that individuals have a finite capacity for self-control of their behaviour. Fulfilment and breach influence this self-control capacity, which in turn, leads to individuals unintentionally altering their safety contribution. Understanding whether individuals engage in safety behaviours as a

function of how they are feeling or as a function of how strong their self-control is enables appropriate interventions to be designed to promote safe behaviour.

1.2 Background and contributions

This research confronts one of the intractable problems facing society, how to make sure workers are safe as well as productive. The frequency of workplace accidents with catastrophic consequences suggests organisations fail to balance their safety and production priorities. More workers are killed at work than at war (ILO, 2004). There have been three major disasters in the last five years alone: the explosion of the oil platform Deepwater Horizon, the capsizing of the Costa Concordia and the sinking of the ferry MV Sewol in which many have died or had their livelihoods impacted by oil pollution.

A rather pessimistic view (Perrow, 1984) suggests that catastrophic man-made accidents are inevitable in today's technologically complex industrial organisations. Another poses the question, "Is safe production an oxymoron?" (Pagell, Johnston, Veltri, Klassen, & Biehl, 2013, p. 1). However, many organisations do not have catastrophic failures, despite their complexity, and manage to reconcile their safety and production goals. Proponents of High Reliability Theory argue that such organisations, characterised as *high reliability organisations*, put safety as their priority and pay attention to the design and management of their organisations (Weick, 1987). Consequently, in the recent past, safety scholars have focussed their attentions on management behaviour and the safety culture it creates.

However, organisational accidents are in part the result of the rule-violating behaviour of employees (Mason, 1997). Yet, the safety sciences have focussed less attention on employees' safety behaviour and rather more on their perceptions of management's commitment to safety, i.e. the safety climate (Neal & Griffin, 2006). This is because focusing on individuals' behaviour in accidents leads to attributions of blame rather than the search for answers (Dekker, 2002).

Reason (2004) argues the pendulum may have swung too far. Increased numbers of safety initiatives have led to operational leaders feeling overburdened and sceptical about the success of increased management intervention (O'Dea & Flin, 2001, p. 50). Additionally, scholars question the utility of studying employee perceptions of safety climate, as they do not readily indicate which human resource management (HRM) practices need to change to improve safety behaviour (Neal & Griffin, 2004).

Accidents and injuries have significant consequences for individuals and society (Kaplan & Tetrick, 2011), yet safety is one of the least studied phenomena in the field of organisational

behaviour comprising less than 1% of research (Barling & Hutchinson, 2000). Data on safety performance is often gathered after the system has already failed, such as fatalities, when what is needed is predictive measures that enable the system to be monitored for signs of weakness (Flin, Mearns, O'Connor, & Bryden, 2000).

Interventions, such as procedures, are often designed to prevent the actions that led up to the last incident and will likely fail to prevent the next (Dekker, 2002). This is because work contexts afford employees many degrees of freedom in respect of choices over behaviour and intervention designers can never foresee all the contingencies governing an employee's choice at a particular point in time (Rasmussen, 1997). However, removing those choices can have negative consequences for workers' mental health (Warr, 1987). Therefore, it is important to understand what causes employees to make the choices they do (Dekker, 2002). However, the problem lies in knowing where to look for answers.

Scholars have rejected the idea that individuals who have accidents do so because they are accident-prone (Froggatt & Smiley, 1964). They also remain unconvinced that general safety training and other motivational programmes can reduce accidents (e.g. Wagenaar & Groeneweg, 1987). Nevertheless, scholars recognise that employees need to be affectively and cognitively engaged in their work to perform safely (Barling, Kelloway, & Iverson, 2003b). Consequently, relational models of leadership (Clarke, 2013) and job characteristics (Clarke, 2012; Nahrgang, Morgeson, & Hofmann, 2011) have been considered for their effects on employees. However, these antecedents do not always relate to outcomes in line with predictions.

Workplace characteristics and leaders' behaviours are changeable and not fixed determinants of employees' affect and cognitions. Good and bad things happen at work (Totterdell, Wood, & Wall, 2006) and there is good and bad in all relationships (Duffy, Ganster, & Pagon, 2002). Accordingly, there is a need to go beyond the use of static models and investigate dynamic workplace events and their effects on the motivational and emotional experiences of employees (Briner, 2000). Similarly, employees' behaviour is not all good or all bad and can vary (Dalal, 2005) just as the motivational and attentional pull of work does (Beal, Weiss, Barros, & MacDermid, 2005). Therefore, there is also a need to investigate work behaviour from the perspective of the employee to understand how their motivational and attentional experiences cause their behaviour to vary.

This research answers these calls and makes several novel and important contributions to the safety and psychological contract fields. First, this research applies psychological contract theory as a new approach to bringing in the employment relationship to understand safety performance. This theory places importance on the relationship between the employer and

employee and the exchange of reciprocal obligations (Rousseau, 1990, 1995). It avoids blaming employees for the consequences of their behaviour, focusing instead on what happens to employees when employers do (Parzefall & Hakanen, 2010; Turnley, Bolino, Lester, & Bloodgood, 2003) or do not (H. Zhao, Wayne, Glibkowski, & Bravo, 2007) fulfil their obligations to them. Thus, it has implications for management and the effect of its promise-keeping behaviour on employees. It also offers insights into the management problem of knowing what to do to encourage employees to behave safely. By testing two pathways from psychological contracts to outcomes, one motivational and the other attentional, it sheds light on employees' self-regulatory mechanisms that influence their capacity as well as their willingness to make a safety contribution. This is both new to safety and to psychological contract theory in general.

Studying the psychological contracts of individuals in high-stakes work offers an opportunity to explore this exchange and the limits of over- and under-fulfilment that employees will or can endure. By examining how individuals reciprocate psychological contract fulfilment and breach with different types of behaviours: safety compliance, safety citizenship and unsafe behaviour, the interrelated nature of reciprocal obligations can be studied. This research thereby offers insights into what employers can do to encourage safe behaviour and to deter unsafe behaviour by shedding light on the obligations that matter for employees' safety behaviour.

Secondly, psychological contract theory can also explain the dynamic variation in employees' safety behaviour. Employers are not always 100% reliable and sometimes renege or over-fulfil on their promises. Employees can experience both under and over-fulfilment from the same employer. Moreover, these experiences can have significant emotional consequences for individuals (Conway & Briner, 2002). By adopting a within-person approach and a diary methodology, this research makes it possible to examine the dynamic fluctuations in employees' motivation and attention and the consequences this has for their safety behaviour.

Lastly, few studies have countenanced the idea that there may be a difference between what employees do intentionally to redress the balance in obligations when they are enraged and what they might do unintentionally as a consequence of reduced capacity to fulfil their obligations. Deploying Affective Events theory (Weiss & Cropanzano, 1996), the programme of research investigates whether an affect-based perspective adds to our understanding of the motivations to behave safely or unsafely. Affect is a previously neglected area of safety research.

This research also makes a novel contribution to psychological contract theory by investigating the impact of fulfilment and breach on an individual's ability to self-regulate their attention. Drawing uniquely on Ego Depletion Theory (Baumeister, Bratslavsky, Muraven, & Tice, 1998),

this research considers the impact psychological contract events have on an individual's capacity to maintain their attention on their work, as well as their motivation. In this manner, this research contributes to a new understanding of the limits of acceptability or the extent of the zone of indifference that individuals will tolerate or have the capacity to bear before their behaviour is altered.

1.3 Chapter structure

Chapter 2 concerns the outcome of interest to this thesis, safety behaviour. First, it discusses conceptualisations of workplace safety. Then, it examines the distinction between accidents and individual safety behaviour as a criterion of workplace safety and the utility of each as metrics of safety performance. Having concluded that individual safety behaviour offers more value to the study of workplace safety, it then moves on to consider how safety behaviour has been defined and operationalised. Subsequently, both the individual and situational causes of safety behaviour are discussed. The chapter reviews the evidence that individual and situational determinants have their effects on safety behaviour though their influence on individuals' motivational and attentional control processes. It identifies the explanatory gaps in the extant literature and indicates where a psychological contract approach might account for inconsistent or contradictory findings.

Chapter 3 presents the focal theory guiding this thesis, psychological contract theory. It starts with a review of the paradigms that have influenced the development of the theory, bringing us up to date with contemporary thinking emanating from neuroscience. This section also includes coverage of the hot debate between the clinical school that advocates needs as the basis of reciprocal obligations, and the cognitive school that advocates promises as the basis. It then moves to consider the types of psychological contracts individuals have and how the contents have been used to explain outcomes. Thereafter, the discussion turns to explore the mediating mechanisms by which fulfilment and breach are presumed to have their effects. It investigates the impact of fulfilment and breach on individuals' motivation and their willingness to reciprocate; i.e. the "motivation pathway". It also considers the impact on individuals' attention and their capacity to reciprocate; i.e. the "attention pathway".

Chapter 4 brings the elements of the thesis together and examines how psychological contract theory can be used to explain individual safety behaviour. First it sets out the research questions that are designed to test the aims of the thesis. It then presents a dual-pathway model that depicts two mediation pathways relating fulfilment and breach to well-being, safe, unsafe,

and unhealthy behaviour; namely a motivation and an attention pathway. It finishes by introducing the empirical studies.

Chapter 5 reports the first empirical study; a longitudinal survey designed to test the model at the between-subjects level on two occasions, six months apart. It examines the relationship of fulfilment and breach to outcomes via violation (motivation pathway) and cognitive failure (attention pathway) testing the thesis's propositions longitudinally as well as cross-sectionally. The moderating roles of self-regulatory focus and emotion-regulation strategy are also considered. Results of Structural Equation Modelling and invariance tests are reported.

In Chapter 6, the second study, a quantitative daily diary is presented. The chapter reports the results of the test of the dual-pathway model at the within-persons level. It uses a similar theoretical framework to the survey, but adds value to the thesis by enabling the dynamic nature of the employment relationship and transient psychological experiences to be examined. The diary study examines daily occurrences of positive (over-fulfilment) and negative (breach) events and the concomitant variations in motivation, attention and safety behaviour over a period of up to 14 days. Once again it considers the moderating influence of emotion-regulation on relationships between predictors, mediators, and behaviours.

Finally, Chapter 7 draws the thesis to a close reviewing the findings of the empirical studies in relation to the aims. It also discusses the limitations of the research and makes suggestions for future research.

1.4 Summary

This chapter set out the aims of this thesis and the theoretical approach adopted by this research. It outlined the theoretical and practical contributions the research makes to safety science and organisational psychology. The chapter finishes with an overview of the content of the seven chapters included in this thesis.

Chapter 2. Work behaviour in safety critical settings

2.1 Introduction

In relation to the first aim of this thesis, which is to explain the on-going variation in safety behaviour using psychological contract theory, this chapter defines the outcome of interest – individual safety behaviour.

The first section draws the reader's attention to the nature of safety performance and to the distinction between dimensions of safety behaviour (e.g. safety compliance, citizenship and unsafe behaviour) and the results of that behaviour (e.g. accidents). Thereafter, the chapter outlines the taxonomies that describe different forms of safety behaviour.

Lastly, given this thesis promotes psychological contract theory as appropriate for explaining individual's safety behaviour, this chapter evaluates alternative theoretical accounts and explains why they are considered lacking. It first considers individual difference accounts before moving on to consider situational causes. The chapter acts as a useful precursor to the third chapter, which considers psychological contract theory as a suitable explanatory framework for safety behaviour.

2.2 Workplace safety performance

Workplace safety is an important topic of study because significant numbers of individuals are harmed or killed each year while carrying out their occupational responsibilities. In Great Britain in the year 2012 to 2013 alone, 148 workers were killed at work, over 78 000 workers were injured and 1.1 million workers suffered from an illness they attributed to current or past work (HSE, 2013). Such statistics prompt the search for answers to the questions of how and why organisational accidents happen and what can be done to improve organisational safety.

Despite more than 100 years of industrialisation, the conceptualisation of occupational safety is unrefined (Swuste, Gulijk, & Zwaard, 2010), the safety literature lacks consistent definitions of constructs (Clarke & Robertson, 2005) and there is confusion over whether safety is an organisational or an individual level phenomenon (Christian, Bradley, Wallace, & Burke, 2009; Kaplan & Tetrick, 2011). This is a significant problem and is due in part to the continued use of accidents statistics as the criterion of workplace safety. This section discusses why this choice

of criterion is problematic and proposes that individual safety behaviour is a better indicator of workplace safety.

2.2.1 Conceptualisations of workplace safety

Criteria are essential for analysing the performance of individuals and organisations (Schmitt & Klimoski, 1991). Yet, as noted above, inconsistency and confusion surrounding constructs of workplace safety continue. These issues are characteristic of the *criterion problem* (Flanagan, 1956): a lack of conceptual, taxonomic and methodological development of criteria resulting in a limited understanding of their causes and consequences. In part, the problem arises because researchers do not agree what represents an appropriate criterion (Austin & Villanova, 1992). In the safety domain, the question centres on whether scholars should continue the quest for a single, objective measure contained in organisational records (Campbell, McCloy, Oppler, & Sager, 1993) or settle for subjective, multi-dimensional measures of behaviour. The next section reviews the arguments for each.

Accidents as a criterion of workplace safety

As long ago as 1926, Deblois forwarded the idea that accidents are *sequences of events*, whereby the cause can be either direct or can occur over the longer term. Thus, the behaviour of an individual may or may not translate into an accident. Heinrich (1931) adds that the consequences of accidents are also a matter of probability. The first accident could result in a major injury or no injury at all, although, fatal accidents may follow a different sequence to non-fatal accidents (Saloniemi & Oksanen, 1998). Deblois (1926) further distinguished between hazards, such as speed or heat, and the harm caused by exposure to them. Accident likelihood is a probabilistic combination of the potential to cause harm multiplied by the exposure. As such, accidents are often context specific and the comparable behaviour of two individuals in different work settings can have very different outcomes simply by virtue of the hazards in the workplace (Froggatt & Smiley, 1964).

Accidents as a metric of workplace safety

The use of accident and injury reports for measuring workplace safety is problematic for two reasons: under-reporting and skewed distributions. Measurement issues surfaced in the 1920s and accident figures were viewed as unreliable indicators of whether safety performance was improving or deteriorating (e.g. Deblois, 1927). Organisations failed to count injured workers and did not always record all fatalities (Swuste et al., 2010). Modern day accident figures are also problematic particularly for non-fatal occupational injuries (Probst, Brubaker, & Barsotti, 2008). Research across a number of industrial sectors suggests national surveillance databases

capture between a third (Rosenman et al., 2006) and a half of the injuries that actually occur (Glazner et al., 1998).

Accident under-reporting

The problem of under-reporting can occur at two levels, the organisational and the individual. Organisational level under-reporting occurs because organisations desire to present themselves as safe in order to win contracts (Leigh, Marcin, & Miller, 2004) and because their employees under-report (Probst et al., 2008). A recent study found the numbers of injuries reported to a government agency did not match the number reported to an insurance company (Probst et al., 2008). Probst and colleagues report that organisations with poor safety climates under-recorded 81% of actual injuries. Organisations with good safety climates record more injuries, but still only 53% of those that occur. Therefore, injury frequencies and organisational safety climate would appear to be confounded. Studies that seek to measure the effectiveness of predictors in determining safety performance may only be capturing the level of under-reporting when they use accident statistics.

Limitations of accident data

Second, the use of accident statistics is problematic as the use of these data rests on the assumption that fewer are better. However, as safety scientists of the 1920s and 30s argued, accidents have multiple causes and their frequency is a function of the hazards present in the work environment as well as the behaviour of individuals. Thus, individuals working in non-hazardous occupations may behave less safely yet suffer fewer accidents than individuals in a high-hazard environment suffer (Kaplan & Tetrick, 2011; Zohar, 2000). This is because the former are not exposed to situations that may harm them and thus the consequences of their actions are trivial in comparison to those working in a high hazard environment. Therefore, firms with better accident records can actually be less safe than those with ostensibly poorer accident records because the records simply reflect the consequences and not necessarily the behaviour of the employees (Kaplan & Tetrick, 2011).

Finally, despite accident data representing an objective criterion of workplace safety (Zohar, 2000,) they are characterised by low base rates; accidents happen to individuals infrequently. Therefore, it may take time to amass sufficient data to conduct analyses. This passage of time may render accident data meaningless as workplaces change with the advent of new technology and processes (Zohar, 2000, p. 594).

Individual safety behaviour as a criterion of workplace safety

Safety performance conceptualised as individual safety behaviour is a more useful criterion of workplace safety than accidents are (Christian et al., 2009). However, the utility of individual behaviour as a criterion lies in its use as a predictor variable; i.e. the more employees behave like X, the more likely they are to be involved in an accident, rather than in its use as a post-hoc explanation of why an accident happened; i.e. the accident happened because employee X did Y. While individual behaviour can be one component in the sequence of events that results in an accident, trying to prevent or predict future accidents by investigating individual behaviours in *past* accident scenarios is unlikely to be fruitful (Rundmo, Hestad, & Ulleberg, 1998). Accidents are often a unique combination of events and the unforeseen or unintentional consequences of actions (Taylor, 1981); the link between the behaviour and the accident is only understood in hindsight by the observer, not in foresight by the actor. Although the behaviour of one individual may or may not be implicated in subsequent accidents, certain behaviours will reduce accident likelihood and others will increase accident likelihood. As well, safety behaviour has a more proximal relationship to its determinants, such as motivation and attention, than accidents do (Christian et al., 2009). Accordingly, it is better and more meaningful to understand the motives for performing certain behaviours and try and predict those rather than explore why people did not do what they should (Dekker, 2002; Rundmo et al., 1998) if we are to prevent accidents from occurring.

Individual safety behaviour as a metric of workplace safety

Christian and colleagues postulate that safety performance equated with individual behaviours can be measured more accurately than accidents can. Accidents are not normally distributed (Lawshe, 1948) and thus statistical analyses, such as Pearson's correlation that are governed by parametric assumptions, inaccurately estimate these data's relationship with predictors (Hulin, 1963) such as are used in the psychological safety literature. Although it is possible to conduct analyses with non-parametric data, safety behaviours like other job performance behaviours are observable— they are what people do - and while inference is sometimes necessary, they are scalable according to the frequency they are performed (Burke, Sarpy, Tesluk, & Smith-Crowe, 2002). Unlike accidents, they are under an individual's control (Campbell et al., 1993), occur more frequently than accidents do and thus, make themselves more amenable to statistical analyses involving psychological determinants. Lastly, unlike accidents, safety behaviour is not *one thing* (Campbell et al., 1993, p. 41), but a collection of components that potentially have their own determinants. It therefore offers the opportunity to gain a multi-faceted insight into

the effects of predictors, such as psychological contract fulfilment and breach on employee behaviour.

Conclusion

To use accident data as the only criterion of an organisation's propensity to cause harm is to under-represent the phenomenon and create obstacles to furthering our understanding of why and how organisational accidents happen. Whereas safety behaviour is not the cause of all accidents, it is crucial to many and is more predictable and more easily measured than accidents are. Therefore, understanding the components and variability of individual safety behaviour is a useful quest. Accordingly, the next section reviews how the construct of safety behaviour has been defined and operationalised.

2.3 Taxonomies of safety behaviours

The objective of any taxonomy of work behaviour is to identify and define the categories or dimensions of behaviours that have positive or negative expected value for the organization (Motowidlo, 2003). It is important to investigate the dimensionality of a performance domain so that the causes and consequences of those behaviours are understood.

This thesis applies a framework (after Motowidlo, 2003) that divides safety behaviour into three classes: (1) mandatory safety behaviour, reflecting behaviours that support the technical function of an organisation and that might be considered in-role, (2) discretionary safety behaviour, reflecting those behaviours that contribute to social and psychological functioning of the organisation and that might be considered extra-role, and (3) counterproductive behaviour, reflecting those behaviours that undermine safety and might be considered anti-role. The section describes (a) the theoretical and operational definitions of the safety behaviours that each framework contains and (b) reviews the empirical support for the dimension.

2.3.1 Mandatory safety behaviour

Every job contains behaviours that an individual must perform, behaviours that are in-role and in which a job incumbent needs to be proficient (Campbell et al., 1993). Where the safety literature is concerned, there have been few attempts to define the safety content of jobs in anything other than rudimentary ways (Kaplan & Tetrick, 2011) with many studies using single scales that only contain a few items, such as Neal, Griffin, & Hart's (2000) measure of safety compliance. There are a few exceptions where multiple-item scales have been devised, such as Cheyne, Cox, Oliver, & Tomás's (1998) 16-item list of safety activities and Griffin, Neal, & Neale's (2000) 28-item measure of air traffic controllers' task performance. However, in respect of the

former, a test of the factor structure revealed only one dimension of mandatory safety performance that closely corresponded to Neal et al.'s (2000) concept of safety compliance (e.g. Pousette, Larsson, & Törner, 2008). In respect of the Griffin et al.'s scale, while six dimensions of task performance emerged, the behaviours were deemed too specific to be applicable to anything other than air traffic control situations, e.g. "responding to pilot requests". The only generalisable measure of in-role safety behaviour found is Burke and colleagues' (Burke et al., 2002) 4-factor model of general safety performance. *General safety performance* is defined as, "the actions or behaviors that individuals exhibit in almost all jobs to promote the health and safety of workers, clients, the public, and the environment" (Burke et al., 2002, p. 432). Burke et al. argued for a general model of safety performance on the basis that there are certain jobs (e.g. shipping) that require an enhanced level of procedural skill in order to perform safely compared to other industries.

They based the development of their model on four premises; (1) safety behaviours like other job behaviours can be scaled according to the frequency they are performed; (2) safety performance is a multi-dimensional construct containing factors related to, but distinguishable from other general models of job performance; (3) as with job performance in other work domains, each factor in the model will have its own relationship with determinants of behaviour; and, (4) will have its own relationship with outcomes, e.g. accidents. They specified *a priori* four factors: Using Personal Protective Equipment; Engaging in Work Practices to Reduce Risk; Communicating Health & Safety Information; and, Exercising Employee Right and Responsibilities.

Support for the 4-factor model

Burke and colleagues found support for their 4-factor model; 550 employees from four organisations in a nuclear waste site rated the frequency with which a "typical" co-worker would perform the 27 behaviours and confirmatory factor analysis indicated that the 4-factor model was an acceptable fit for the data. However, the factors were also highly correlated, with intercorrelations ranging from .62 to .79 indicating that an underlying latent factor of overall safety performance may exist and the individual factors may not be conceptually distinct. No other studies were found that attempted to confirm the factor structure of this measure.

Notwithstanding this finding, it is still regarded of practical and research significance to understand the dimensionality and the determinants of individual safety behaviours if we are to satisfy the HRM problems of (1) providing the correct inducements for contributions to safety performance and (2) identifying and designing appropriate interventions to increase the frequency with which these behaviours are performed.

2.3.2 Discretionary safety behaviour

This sections reviews the safety behaviours that are classed as discretionary. Two labels are attached to this class of behaviour: safety participation and safety citizenship reflecting the contextual, citizenship distinction in the job performance literature. The section first considers safety participation and its distinction from safety compliance. It then reviews the multi-dimensional concept of safety citizenship.

Safety participation

Contextual aspects of safety performance are labelled *safety participation*, defined as, “behaviors such as participating in voluntary safety activities or attending safety meetings” (Griffin & Neal, 2000, p. 349). According to Griffin and Neal, these behaviours contribute to overall system safety, but are discretionary and thus can be distinguished from safety compliance behaviour, which is mandatory. The basis for this differentiation is that safety participation is determined by safety motivation and safety compliance by safety knowledge.

The most recent version of their measure contains just four items, for example, “I often take part in development of the safety requirements for my job”, but is very popular with researchers in the safety climate and leadership research domains. A recent meta-analysis of safety behaviour (Christian et al., 2009) organised the review around Neal and Griffin’s conceptualisation and distinguished the causes of safety compliance from the causes of safety participation.

Empirical support for differentiating mandatory and discretionary safety behaviour

The task (safety compliance) and contextual behaviour (safety participation) distinction was evident in the archival records of seven Australian manufacturing and mining organisations (Griffin and Neal, 2000). Although the distinction between safety compliance and safety participation was maintained in a second study drawing on self-reports of behaviour (Griffin & Neil, 2000; Study 2), a negative link between safety compliance motivation (e.g. “it is important to use the correct PPE”) and safety participation (e.g. “I volunteer for safety-related tasks”) was found. The more individuals were motivated to engage in compliance behaviours, the less willing they were to engage in activities that support the safety environment.

This finding would suggest that safety compliance is also determined by motivation and thus throws into question the differentiation of the two types of behaviour on the basis that one is discretionary and the other mandatory. The distinction may reflect that individuals have a finite capacity to perform safety-related behaviours and may focus on those that are formally recognised when faced with a choice, a premise that is tested in this thesis.

Safety citizenship behaviour

Safety citizenship behaviour (SCB) is defined as being, “similar to organizational citizenship behaviors except they are focused on improving the safety performance of other team members and the organization” (Hofmann, Morgeson, & Gerras, 2003, p. 171). Hofmann and colleagues maintained that, in the presence of high quality leader-member relationships, subordinates would be obligated to reciprocate their leaders’ behaviours and “pay back” (p. 171) by enlarging their role behaviours beyond formal role requirements. Drawing on the OCB literature, Hofmann and colleagues devised a 27-item measure of safety citizenship role definitions conceptualised into five dimensions: safety-related helping, voice, stewardship, whistleblowing, safety-oriented civic virtue, and initiating safety-related change.

Empirical support for the dimensions of safety citizenship

In order to test the construct validity of the measure, Hofmann and colleagues included six items from Burke et al’s (2002) general model of safety performance to represent core safety role definitions. Team members in the U.S. Army rated the extent to which the role definitions were considered part of the job, ranging from 1 (*expected part of my job*) to 5 (*definitely above and beyond what is expected for my job*). There was a significant difference between the mean ratings on the core ($M = 4.15$) and safety role definitions ($M = 3.95$). However, the mean scores were both above the midpoint of the scale, indicating that all behaviours were towards the “expected part of my job” end of the scale.

As has been found in the OCB research field (LePine, Erez, & Johnson, 2002), Hofmann et al.’s dimensions of safety citizenship role definitions are highly intercorrelated with an average r -value of .78. These findings are consistent with those of Le Pine et al. (2002) who found that relations amongst dimensions of OCB at the population level, with the exception of sportsmanship and civic virtue, are as high as reliability estimates.

Whereas OCB research has a long history, SCB is a relatively new concept (Didla, Mearns, & Flin, 2009) and only a few studies (e.g. Conchie & Donald, 2009; Turner, Chmiel, & Walls, 2005) have subsequently employed the six dimensions of SCB as defined by Hofmann et al. (2003).

Therefore, there is little information to clarify the dimensionality of SCBs. One study that did examine the factor-analytic structure of Hofmann et al.’s safety citizenship role definitions in a sample of railway workers (Turner et al., 2005) found neither a single factor nor a six-factor model provided a good fit for the data. Lately, researchers in the psychological safety field have opted to use single scale measures of safety citizenship behaviour, such as voice (Tucker,

Chmiel, Turner, Hershcovis, & Stride, 2008) or construct scales from a range of safety performance measures (e.g. Mearns & Reader, 2008).

For the most part, studies have sought to confirm the reciprocal social exchange of supportive relationships (organisations, supervisors, and co-workers) and safety behaviours without much recourse to theory. Oftentimes the mediating mechanism of motivation is implied but not stated. One study that explicitly investigated the mediating role of intrinsic motivation on a selection of safety citizenship behaviours found that intrinsic motivation mediated the relationship between safety leadership and safety voice but not between safety leadership and helping (Conchie, 2013). It would appear therefore, that not all dimensions of safety citizenship are reflective of an underlying latent factor that represents discretionary behaviour governed by motivation.

Originally, the citizenship construct was divided into two according to the target of the behaviour; namely colleagues or the organisation (e.g. Smith, Organ, & Near, 1983). The findings above suggest that research is needed to establish what other factors underlie non-mandatory safety behaviour and whether they are different for those behaviours targeted at coworkers and those targeted at employers as has been found in psychological contract research (cf. Conway, Kiefer, Hartley, & Briner, 2014).

2.3.3 Counterproductive safety behaviour

This thesis holds to the view that in order to understand what causes individuals to contribute to the organisation's safety goals and enact pro-safe behaviours, we also have to understand what causes individuals to withdraw that contribution and behave in an unsafe manner. This last section reviews the construct of unsafe behaviour; safety behaviour that has negative expected or intended value for the organisation.

Counterproductive behaviour

Researchers in the field of contextual performance recognised that employees are not only inclined to behave in ways that support the organisation's effectiveness, they are also inclined to behave in ways that are detrimental to the organisation (e.g. Andersson & Pearson, 1999). They will take underserved breaks (Smith et al., 1983); ignore procedures when personally inconvenient (Borman & Motowidlo, 1993); and, refuse to take time to help others when they ask (Borman et al., 2001). However, until very recently, no distinction was made between behaviours that represent intended negative value (deliberately withholding effort) versus behaviours that represent unintended negative value (forgetfulness). Negative behaviours regardless of intentionality were simply reverse-scores of positively phrased items (Motowidlo,

2003). Treating antisocial work behaviours intended to harm the organisation as polar opposites of prosocial work behaviours intended to help the organisation suggests a common causal root. Yet common sense dictates that disinclination to help a work colleague is vastly different from deviant behaviour such as theft (Motowidlo, 2003). Subsequently, researchers have argued for a separate class of behaviour called *counterproductive behaviour* (Gruys & Sackett, 2003; Martinko, Gundlach, & Douglas, 2002; Sackett, 2002; Sackett & DeVore, 2001) that is not simply low-level organisational citizenship behaviour.

Meta-analytic research has supported the conceptualisation of CWB as a separate construct from OCB and deemed that the two are not polar opposites of the same latent factor at the person level (CWB-I) although the distinction is less robust at the organisational level (CWB-O) (Dalal, 2005). Principally, this finding means that individuals can engage in both types of behaviours; performance of citizenship behaviours does not preclude performance of anti-citizenship behaviours.

Unsafe behaviour

In the contemporary safety literature, efforts have been devoted to conceptualising *safe* not *unsafe* behaviour as evidenced by the fact that behavioural items in safety performance constructs are largely phrased in the positive: *I use the correct safety procedures for carrying out my job* (e.g. Neal & Griffin, 2006). *Unsafe* behaviour is implicit in low levels of agreement with the safety compliance items; i.e. unsafe behaviour is simply the polar opposite of safe behaviour and not an independent construct potentially determined by causal factors other than individual differences in safety knowledge and motivation. This implicit assumption may not be valid and these measures may not accurately capture unsafe behaviour.

Human error

Previously, the construct of unsafe behaviour received much research attention when it was conceptualised as human error, defined as “a generic term to encompass all those occasions in which a planned sequence of mental or physical activities fails to achieve its intended outcome and when these failures cannot be attributed to the intervention of some chance agency” (Reason, 1990, p. 9)

Norman (1981) classified human error on the basis of a cognitive functioning model. He categorised erroneous actions into three types: slips / lapses, mistakes and violations; a slip is an execution failure, a mistake is a goal activation error, and a violation is an action that breaks a rule. This human unreliability was deemed the cause of accidents given the consistent finding that unsafe acts are implicated in around 70% of accidents (Mason, 1997). The term *human*

error fell out of use in safety science due to its pejorative undertones (Neal & Griffin, 2006). Accident investigations focused on trying to find who was culpable rather than trying to find out why people did what they did (Dekker, 2002). Furthermore, it was found that human error taxonomies were only likely to be useful measures of safety performance when highly domain specific – lapses and mistakes are context dependent and thus the taxonomy is only useful for describing the errors people make rather than predicting them (Kaplan & Tetrick, 2011); for example, knowing that a pilot omitted an item on a list of pre-departure checks enables a description of the error, but it does not explain why the omission took place and thus what might make it occur in the future.

Recently, scholars have renewed interest in the concept of human error, in particular cognitive failures (Wallace & Chen, 2006; Wallace & Vodanovich, 2003b). However, the interest has been from an individual difference perspective whereby cognitive failure is conceived as a trait. Cognitive failure is deemed to cause unsafe behaviour and accidents rather than as a consequence of some other predictor (e.g. resource depletion) and thus the potential that cognitive failure is subject to within-person variation has been overlooked.

Although the human error literature failed to provide a useful measure of unsafe behaviour, it has identified a valuable distinction between unsafe behaviour that is unintentional (lapses) and unsafe behaviour that is intentional (violation) (Reason, 1990). The next sub-section discusses the concept of violation, i.e. deliberate unsafe behaviour.

Violations

In many industries, violations of safety rules are reportedly commonplace (Reason, Parker, & Lawton, 1998) and lead to accidents (Mason, 1997), albeit for the most part these violations are non-malevolent – the harm was not intended and the consequences of actions were unforeseen (Taylor, 1981). For example, the capsizing of the Herald of Free Enterprise was due in part to the ship leaving the berth with its bow doors unintentionally left open.

Despite Mason's findings, there is little research that investigates rule violations in work settings (Alper & Karsh, 2009) and thus there is little understanding of this construct. Empirical studies that have examined the construct of unsafe behaviour have tended to employ it as a one-dimensional factor and where behaviours are categorised, those categories have reflected the situations in which the behaviours are performed e.g. *Using a tool to prop a door open* (Hofmann & Stetzer, 1996). Reason and colleagues (Reason, 1990; Reason et al., 1998) are perhaps the only scholars to have proposed a hierarchical structure to deliberate unsafe behaviour. They distinguished between three categories of safety violations: *routine, optimising and situational*.

Routine violations involve corner-cutting where the individual takes the path of least effort between two tasks. Optimising violations are the consequence of individuals' choices between functional goals (successful task completion) and personal goals, such as thrill-seeking. The third category, situational violations, occur when individuals are "provoked by organizational failings" to ignore rules in order to get the job done (Reason et al., 1998, p. 293). Hansez and Chmiel (2010) reported a negative correlation between routine and situational violations (-.50) indicating support for the distinctiveness of these facets of unsafe behaviour. However, their study was cross-sectional in nature and only investigated internal construct validity.

Other measures of violations that have been developed have shown adequate internal consistency reliability (e.g. Hofmann and Stetzer, 1996) and demonstrated strong correlations with accident involvement at the individual level (Mearns, Flin, Gordon, & Fleming, 2001) and the team levels (Hofmann & Stetzer, 1996) thereby suggesting external construct validity. However, more recently, Clarke, (2006a) found no relationship between unsafe behaviour and accidents in an automobile manufacturing plant, but this may reflect her use of dichotomous raw accident data. Thus the concept of unsafe behaviour is also theoretically under-developed and warrants further investigation.

2.3.4 Criticisms and conclusions

The psychological safety literature has made an important contribution to our understanding of occupational safety by distinguishing between individual safety behaviour and organisational safety outcomes. It has also emulated the job performance literature and adopted the task-contextual performance dichotomy reflecting the divide between mandated and discretionary behaviour. The distinction is consistent with Organ's (1988, p. 4) notion of discretionary and non-discretionary work behaviours where the former "is a matter of personal choice such that its omission is not generally understood as punishable" and the latter an enforceable requirement of the role or job description as specified in an individual's employment contract.

Despite the maintenance of this distinction in the safety literature, research in the area of contextual performance has raised doubts about the extra-role and discretionary nature of contextual behaviours (Stone-Romero, Alvarez, & Thompson, 2009) and challenged traditional notions of performance that are determined solely by individual difference variables (Parker & Turner, 2002). These issues raise doubts as to the security of the safety compliance – safety participation distinction in the safety literature on the basis that one is mandatory and the other is discretionary. Furthermore, given that individuals also engage in unsafe behaviour, which would suggest that even mandatory behaviour might be discretionary, the foundation on which the distinction between these constructs rests would appear a little shaky.

In the OCB and CWB literatures, examination of the relationship between the citizenship and anti-citizenship constructs has led to an employee-centric view being proposed in which these behaviours are seen as adaptive (Dalal, 2005) and emotion-based (Spector & Fox, 2002). Rather than view CWB (and OCB for that matter) as reciprocal behaviours targeted at individuals or organisations, an employee-centric view proposes that these behaviours are better understood at the within person level of analysis and as reactions to workplace events (Briner, 2000; Conway & Briner, 2002) or attempts to gain respite from their work demands (Boucsein & Thum, 1997).

With few exceptions, (e.g. Martínez-Córcoles, Gracia, Tomás, Peiró, & Schöbel, 2013) studies that have employed measures of unsafe behaviour have used them on their own and not with other measures of safety behaviour such as safety compliance. Thus, it is not possible to say how unsafe behaviours relate to safety compliance and contextual safety behaviours or to say whether the constructs are distinct aspects of safety performance and thus have different patterns of relationships with antecedents. Furthermore, it is not possible to say why individuals might withdraw one aspect of safety behaviour and preserve another.

Lastly, there is the issue of the direction of causality; the majority of safety studies are cross-sectional in nature and so it is not possible to determine whether the antecedents are in fact antecedents and not consequences. Thus, it is not possible to identify the inducements that organisations should offer to employees to perform safe behaviours more often (March & Simon, 1958). Second, it does not help us understand why individuals might actively harm the functioning of their organisational environment and engage in unsafe behaviours.

Conclusion

In sum, the criterion problem (Flanagan, 1956) is in evidence in that the safety performance construct is ill-defined, under-developed, and its operationalisation as a between-persons construct masks potentially illuminating and important mechanisms that govern individuals' safety compliance, participation and unsafe behaviour. This thesis seeks to address these concerns. It studies a troika of safety behaviours and their relationship with proximal (motivation and attention) and distal (fulfilment and breach) antecedents to explicate the reasons employees are compliant, proactive, or reductive in the performance of their safety obligations.

2.4 Introduction to the causes of safety behaviour

Organising the safety literature according to the causes of individual safety behaviour is challenging as safety scholars often invoke several theories to explain direct and indirect causal pathways to safety compliance, participation and unsafe behaviour and often these are post hoc; for example, the safety climate literature frequently raises social exchange theory (Blau, 1964) to explain discretionary behaviour such as safety participation.

There have been several recent reviews (e.g. Beus, McCord, & Zohar, 2016; Kaplan & Tetrick, 2011) and meta-analytical studies (e.g. Beus, Dhanani, & McCord, 2015; Christian et al., 2009; Clarke, 2006b, 2012, 2013, Clarke & Robertson, 2008, 2005; Nahrgang et al., 2011) that have explored person and situation antecedents to safety behaviour, but these excellent papers, while furthering our understanding of the relationships between variables, i.e. how strongly X is related to Y, have done less for advancing our understanding of the causes of safety behaviour and *why* individual differences or features of the workplace influence employees' contribution to the safety performance of their organisation.

The first aim of this thesis is to use psychological contract theory to explain the on-going variation in individual safety behaviour. In order to justify using this theory, first, the limitations of other accounts need to be examined. It is important to point out that this thesis does not investigate person and situation antecedents as explanatory variables for safety behaviour, primarily because safety scholars have already done this, but also because knowing that broad-based traits and work features relate to individual differences in safety behaviour does not generally help with understanding the dynamics of employees' safety performance.

Rather, this thesis maintains that the utility of studying personal disposition and workplace features lies in exploring their ability to explain individuals' motivation and its withdrawal as well as individuals' attentional capacity and its exhaustion. In other words, it explores the relationship of person and situation antecedents with self-regulation of motivation and attention. Accordingly, the next section considers the explanations that safety scholars have used and unfolds as follows: first, it discusses the individual causes of safety behaviour and then, the situational causes of safety behaviour. Within each subsection, the discussion considers (a) the support for the propositions, before examining (b) the self-regulatory mechanisms (motivation and attention) by which each antecedent is supposed to have its effects on safety behaviour.

2.5 Individual causes of safety behaviour

Given the thesis aims to explain *on-going* variation in safety behaviour and not stable differences between individuals, the review that follows focuses on the factors that influence an individual's motivation or capacity to perform safely. The review progresses as follows. First, it explores the controversial hypothesis that personality can predispose certain individuals to be "accident-prone"; second, it examines the self-regulatory mechanisms by which personality has its effects on behaviour; and third, it considers the reasons why certain traits are relevant for safety compliance, safety participation and unsafe behaviour.

2.5.1 Personality and safety behaviour

Since the advent of industrialisation, researchers have used a variety of causal models to account for unsafe behaviour, but in the early part of the twentieth century, these focussed on the individuals' personality. This section reviews the research that examines the personality and safety behaviour relationship.

Accident-Prone Hypothesis

In 1919, the Industrial Fatigue Board commissioned a study of accidents for women in hazardous occupations (Greenwood & Wood, 1919) the results of which concluded that there are prudent workers and there are clumsy workers (Swuste et al., 2010). In 1925, Eric Farmer, a psychologist interested in detecting and screening out the susceptible worker, coined the term *accident proneness* given the observation that some individuals appear to be involved in more accidents than other individuals are. However, in the 1960s, the accident-prone personality hypothesis was largely invalidated because, as Frogatt and Smiley (1964) argue, it is almost impossible to control for the inequalities in risk that individuals are exposed to. Furthermore, they demonstrated that some individuals are more likely to report trivial accidents than other individuals are and thus reporting and proneness are confounded.

While Frogatt and Smiley's work repudiates a personal disposition for accident proneness, more recently a meta-analysis found that some individuals are more likely to be involved in repeated accidents and the number observed in this group is higher than expected by chance (Visser, Pijl, Stolk, Neeleman, & Rosmalen, 2007). The authors conclude that accident proneness exists, but research is hampered by the variety of operationalisations of the concept and thus it is not clear what the underlying mechanisms are that predispose individuals to repeatedly experience adverse events. This thesis hopes to shed light on this problem.

In the recent safety performance literature, four recent meta-analyses have considered the role of personality in relation to safety behaviours and accidents (Beus et al., 2015; Christian et al., 2009; Clarke & Robertson, 2008, 2005). However, there has been little research to explain *why* certain personality factors are related to safety behaviour and accident involvement other than intuitive ones such as conscientiousness (e.g. sense of duty to follow rules and procedures) (Kaplan & Tetrick, 2011).

Kanfer and colleagues (Kanfer, Ackerman, & Heggestad, 1996) have posited that there are traits that lead to the deployment of two distinct self-regulatory strategies: motivational control and emotional control, which have the function of keeping effort and attention focussed on the task and keeping performance anxieties at bay. The following section examines the support for the two self-regulatory strategies as identified by Kanfer and colleagues and considers first, the relationship between conscientiousness, motivational control and safety behaviour before turning to examine the relationship between emotional stability, emotional control and safety behaviour.

Motivational control and safety behaviour

According to recent accounts, although individuals differ on characteristics such as personality, it is not these traits *per se* that influence behaviour, it is the effect that these traits have on individuals' self-regulatory motivational processes that determines individuals' work effectiveness (Li, Barrick, Zimmerman, & Chiaburu, 2014). For example, Judge and Ilies (2002) demonstrated that the self-regulatory processes of task self-efficacy (having the confidence in one's abilities), performance expectancies (believing that effort will achieve a reward) and goal striving (the motivation to resolve discrepancies in the current level of achievement versus the desired level) are the key to understanding how personality affects behaviour. They found that the traits of conscientiousness (average $\beta = .23$) and emotional stability (average $\beta = -.27$) have the strongest and most consistent effects on these three motivational processes. The following examines the findings in a safety context.

Conscientiousness

Christian et al (2009) hypothesised that conscientiousness would predict safety behaviour; individuals high on this construct would exhibit greater goal commitment, higher self-efficacy, engage in self-development, be more attentive to work tasks and less prone to cognitive failures (Wallace & Chen, 2006; Wallace & Vodanovich, 2003b). Contrary to their hypotheses, they found conscientiousness had a very weak relationship with safety motivation (0.09) and weak relationships with overall safety behaviour (composite of compliance and participation)

suggesting that goal striving has limited effects on safety behaviour. The relationship with outcomes was strongest for accidents (-.26), suggesting that the more attentive individuals are to work tasks, the less likely they are to be involved in accidents.

In two studies, Clarke and Robertson (2008, 2005) examined the relationship of personality with accident involvement. In their 2005 study, they found that conscientiousness was only one of two predictors that had credibility intervals that did not include zero. However, in their 2008 study, they excluded conscientiousness due to the high standard deviation of the studies' correlation coefficients. Additionally, Salgado's (2002) meta-analytical review of personality and behaviour-withdrawal studies found that conscientiousness predicted deviant behaviours, but not accidents. In Salgado's analysis, none of the other personality variables predicted accidents either.

These results suggest that goal striving has modest effects on safety behaviour and raise the possibility that trait conscientiousness affects self-regulation of on-task attention (Wallace & Chen, 2005) as well as on-task effort. This thesis proposes and tests the idea that safety behaviour is the consequence of attentional as well as motivational interruptions arising from fulfilment and breach of the psychological contract rather than conscientiousness.

Locus of control

Locus of control is one of the three most studied traits in relation to motivation (Judge & Ilies, 2002). Given an external locus of control, individuals' self-efficacy beliefs are likely to be diminished (Judge & Ilies, 2002) and thus they are likely to report lower intrinsic safety motivation with concomitant decrements in safety behaviour (Christian et al., 2009). In respect of safety performance expectancies, Christian et al. report significant moderate relationships of locus of control with safety behaviour and safety outcomes, with the strongest relationship for safety participation ($M\rho = .43$) followed by safety compliance, ($M\rho = .25$), and accidents ($M\rho = -.26$). Therefore, the expectancy that one's efforts will be rewarded appears to be important for one's motivational control and contextual safety performance. While it is likely that personal disposition is important, the proposals examined herein is that the fulfilment of the psychological contract gives raise to the expectancy that one's efforts will be rewarded as promised.

Extraversion

Where job performance is concerned, Judge, Rodell, Klinger, Simon, & Crawford, (2013) report that it is extraverts' tendency towards proactivity that relates to task performance through self-

efficacy motivation and their experience of positive emotion that facilitates contextual performance.

In the safety performance literature, the focus of research has been on the relationship of a facet of extraversion with safety behaviour and outcomes; namely, *excitement seeking*. Clarke and Robertson (2005) report that individuals high on this trait are deemed to have a propensity towards risk-taking behaviour (Jonah, Thiessen, & Au-Yeung, 2001) and lower tolerance of monotony leading to decreased vigilance (Koelega, 1992). However, given the relationship of extraversion with task and contextual performance reported above, self-efficacy aspects of extraversion, such as excitement seeking, should also facilitate safety behaviour through task engagement (George & Brief, 1992; Judge & Ilies, 2002). Christian et al. (2009) report no significant relationships of extraversion or its facet excitement seeking with any aspect of safety behaviour or outcomes.

Given the wide variation in correlations between extraversion and safety performance, Clarke and Robertson (2005) suggest that moderators may be involved and the extent to which work is routinized or team-based may influence this predictor-criterion relationship. An alternative account proffered by this research is that it is the affect-inducing properties of events at work that are responsible for positive affect and task engagement.

Agreeableness

Judge and Ilies (2002) report that this trait is noticeable by its absence in the study of performance motivation, albeit also note that individuals high on agreeableness are likely to “set less ambitious performance goals because they are motivated more by communion ... than agency” (p. 803). Nevertheless, they go on to report that the strength of the trait’s relationship with goal-striving motivation is second only to conscientiousness, but negative in sign, which would suggest that the more independent individuals are the more apt they are to pursue self-serving goals. Li et al. (2014) report that the effects of agreeableness on contextual behaviours are indirect through job satisfaction (Ilies, Fulmer, Spitzmuller, & Johnson, 2009) suggesting an affect driven mechanism. Similarly, Spector and Fox (2002) argue that aggrieved employees whose traits dispose them to react to workplace events with passive-aggressive behaviour (i.e. low agreeableness) are more likely to engage in counterproductive work behaviours and thus this trait might be more relevant for withdrawal behaviours.

Safety scholars have paid little research interest to agreeableness such that Christian et al (2009) excluded it as a predictor variable from their meta-analysis. The only recent study examining agreeableness in relation to pro-safe behaviour suggested that more agreeable

individuals were not inclined to more safety voice, an aspect of safety citizenship behaviour (Tucker et al., 2008).

In two meta-analytic studies (Clarke & Robertson, 2008, 2005), agreeableness had the most consistent and supported relationship with accidents leading Clarke and Robertson to argue that individuals low on agreeableness “may be less able to cooperate with others effectively and more likely to respond aggressively to situations” (2005; p. 359) increasing their risk of being involved in accidents particularly where team-based working is prevalent; a theory supported by their analysis. However, given that many of the studies entered into the meta-analyses are cross-sectional in nature, the causal direction is unclear. Does agreeableness cause the motivation to withdraw leading to accidents, or do workplace events (e.g. accidents), cause an emotional reaction that employees are motivated to alleviate by withdrawal?

Conclusion

As credible as the motivational control account is for explaining personality's effects on behaviour, it does not fully account for the relationship with safety behaviours. Judge and Ilies (2002) report that most motivation researchers have been concerned with motivation in one direction only; namely the motivation to perform and not the motivation for withdrawal. Other motivation scholars have suggested that a complementary motivational process exists: the motivation to achieve positive affect (e.g. Naylor, Pritchard, & Ilgen, 1980) and this may or may not be supportive of performance.

Spector and Fox (2002) forwarded an emotion-centred model to account for both productive and counterproductive work behaviour, suggesting that the work environment has the power to elicit positive and negative emotional reactions from its employees and these emotional reactions in turn activate behaviour. They argue that conditions, such as psychological contract violation, will trigger emotions whose role it is “to energise the individual physiologically and to induce appropriate action” and go on to state, “emotion motivates behaviour that will reduce negative feelings and enhance positive feelings” (p. 273). This thesis examines if this is so and whether psychological contract events are more reliable and consistent predictors of pro- and unsafe behaviour through their effects on employees' motivational control.

Emotional control and safety behaviour

The second self-regulatory mechanism that Kanfer and colleagues identified was an emotional control mechanism, suggesting that individuals who are able to maintain an emotional equilibrium are better able to focus their attention on tasks. This section considers how emotional control aspects of personality are related to safety behaviours.

Neuroticism

In keeping with the cognitive resources view of personality, individual's low on emotional stability are likely to expend cognitive resources controlling anxiety rather than devoting them to on-task performance (Kanfer & Ackerman, 1989) and thus will report lower safety performance (Christian et al., 2009). Due to their distractibility, they are also expected to experience greater involvement in accidents (Clarke & Robertson, 2005).

In regards neuroticism, Christian et al.'s meta-analysis found no significant relationship with safety compliance or safety participation. With respect to safety outcomes, Christian et al.'s study found a weak but significant relationship ($M\rho = .19$) whereas neither of Clarke and Robertson's studies found a reliable relationship with safety outcomes. It would appear from these studies that emotional control matters little for pro-safe behaviour and has minimal effects on accident involvement at the between-person level.

Within-person variations

While individual difference scholars underscore the benefits of personality traits as predictors due to their stable and long lasting relationships with work behaviour (e.g. Li et al., 2014), more recently, interest has turned to intra-individual variations across time and the effects of mood on behaviour (Spector & Fox, 2002; Weiss & Cropanzano, 1996) or the effects of depleted resources in particular performance episodes (Beal et al., 2005). Unfortunately, most meta-analyses that examine the relationship of personality factors with work behaviour are based on research that is cross-sectional in nature and at the between subjects level of analysis (Dalal, 2005). In the safety literature, the idea that safety behaviour can vary over time is not recognised and thus no studies could be found examining within-individual variations in motivational or emotional control and safety behaviour. This research considers whether safety behaviour is dependent on the attentional resources individuals have at their disposal, resources that are contingent on the how well their employment relationship is functioning.

Conclusions

In the safety domain, it is argued that the utility of studying personal disposition lies in its ability to predict individuals' safety motivation and the withdrawal of that motivation rather than understand why certain traits relate to certain behaviours. This thesis does not investigate individual differences in personality as an explanatory variable for safety behaviour, primarily as safety scholars have already addressed this, but because personality is assumed to be a distal and largely invariant causal factor. Conversely, this thesis views safety behaviour as dynamic and changing within-persons as well as between.

Instead, this review of personal disposition highlighted a potentially more fruitful avenue to pursue; namely, that there are essentially two important self-regulating mechanisms that affect individuals' behaviour: a motivational self-regulation system and an emotional self-regulation system (Kanfer et al., 1996; Kanfer & Heggstad, 1999). While there is no doubt that individuals' personality differences influence which mechanism dominates, these mechanisms are likely to be influenced by events in the workplace and used dynamically to regulate behaviour. Thus, understanding how events impact on self-regulatory mechanisms offers the opportunity to predict on-going variations in safety behaviour. This thesis aims to explore this proposition.

2.6 Situational causes of safety behaviour

It has long been recognised that human behaviour is a function of the person *and* the environment. Although the weight afforded to each is disputed, it is generally agreed that the environment has the power to determine behaviour (Endler & Magnusson, 1976; Meyer, Dalal, & Hermida, 2010; Mischel, 1973, 1977). Given that most safety behaviour of interest to this thesis is performed in the context of a work environment, this section examines the power of the workplace to determine safety behaviour and reviews the theoretical accounts given to explain the nature of its influence on safety performance.

2.6.1 Work design

No theory of work performance is complete without considering the effect of work design on individuals' performance. From the physical working environment (heat, light, noise), the social working environment (interdependencies and division of labour) to the psychological working environment (autonomy, complexity, demands) the influence of tasks, technology, and interpersonal relationships on individual's work behaviour and well-being continues to be of interest to scholars (Parker & Turner, 2002).

The scope of the subject is considerable and spans more than a century. There have been two research streams that have occupied scholars' minds; the characteristics of jobs that (1) impact their incumbents' *motivation* to perform, and (2) those that impact their incumbents' attentional resources and influence their *capacity* to perform. This section examines each aspect of the psychological working environment and its influence on safety behaviour.

Work design and motivational control

This section reviews support for the notion that work design influences employees' motivation to work safely.

Behavioural-based Safety Management (BBSM)

Organisations have sought to apply Taylor's behaviourist approach and actively manipulate behaviour-reward contingencies in order to strengthen the motivation to comply with safety rules and procedures. The technique, known as BBSM (Krause, Hidley, & Hodson, 1997), achieves compliance by the application of goal-setting theory in which safe behaviours are defined and targets set for the frequency with which they should be performed. A system of monitoring, training, and feedback provides the information on progress towards goal attainment, the reward, and theoretically the motivation to comply. Over time, repeated reinforcement through feedback shapes the ratio of safe to unsafe behaviour leading to the development of a "culture of acceptable behaviour" (Tharaldsen & Haukelid, 2009, p. 387).

Grindle, Dickinson and Boettcher (2000) report that this approach has utility in a wide variety of occupational settings, including shipping and is particularly effective if the components of training, goal-setting and feedback are included. Reviews of the technique have concluded that application of BBSM process can achieve statistically significant reductions in base-line accidents rates (Tuncel, Lotlikar, Salem, & Daraiseh, 2006) that are sustained over several years (Krause, Seymour, & Sloat, 1999).

However, critics report that unless employees believe in the effectiveness of BBSM, trust in management, are educated in the process, and are held accountable through the appraisal process, employee involvement is less likely (DePasquale & Geller, 2000). Similarly, Cox, Jones and Rycraft (2004) found in their study of nuclear power plants that a programme will fail if employees perceive that management use the process as a means of spying or as a weapon and employees' experiences are not consistent with their understanding of a "just culture" (Reason, 1998).

When it comes to the efficacy of a BBSM initiative, it is ventured that psychological contract fulfilment and breach can explain its success or failure. Psychological contract theory has shown that individuals perform a range of behaviours for the rewards promised by their employer (Rousseau, 1995; Schalk & Roe, 2007). Behaviour continues as long as the rewards are forthcoming, i.e. psychological contract fulfilment. When the reward-behaviour contingency is disrupted when their employer reneges on its commitments, i.e. psychological contract breach, individuals lose faith in the reliability of the rewards and disengage from their work (Robinson, 1996).

High Quality Work (HQP)

Perhaps one of the most well-known and popular theories of job design that explored the motivating potential of work is the *Job Characteristics Model* of Hackman and Oldham (JCM; Hackman & Oldham, 1975, 1976). According to the JCM, jobs designed such that they have skill variety, task identity (a whole process), task significance (tasks that are important), autonomy (decision latitude) and job feedback (success or failure is readily apparent) will lead individuals to (i) experiencing their work as meaningful, (ii) feeling a sense of responsibility, and (iii) knowing that they are making a difference. In turn, these critical psychological states will drive the development of intrinsic motivation, job satisfaction, and ultimately work performance. In the context of safety, high quality jobs are proposed to have the same beneficial effects on individual employee safety behaviours (Barling et al., 2003b).

Job autonomy

In a longitudinal study, Parker, Axtell, & Turner (2001) investigated two aspects of high quality work and their relationship with safety compliance; namely job autonomy and a supportive work context. However, their proposition that work characteristics would engender affective commitment and goal alignment, which would in turn predict safety compliance, was not generally supported. They posited that commitment may be more relevant for contextual safety behaviours rather than safety compliance as has been found in the organizational citizenship literature (e.g. Organ & Ryan, 1995). However, Turner et al., (2005) found no support for the hypothesis that jobs high on autonomy and challenge would predict more flexible safety role orientations. Although they did not investigate organisational commitment, Turner and colleagues' results raise questions about the impact of enriched jobs on discretionary safety behaviour through their influence on motivation.

In a meta-analytic study Clarke (2010) examined *inter alia* individual perceptions of job quality as a facet of psychological climate and as an antecedent to job satisfaction and organisational commitment. Clarke tested whether these factors would predict safety behaviour outcomes. The only facets of jobs that had an effect on safety behaviour via satisfaction and commitment were perceptions of leaders (e.g. leader trust and support) and perceptions of the organisation (e.g. openness of information).

In light of these findings, it is worth considering Turner et al's (2005) suggestion that it is more fruitful to consider a social exchange framework and employees' attitude towards their own safety responsibilities (as opposed to the organisation's) where job characteristics are

concerned. This thesis answers Turner and colleagues' call and seeks to establish if psychological contract fulfilment can explain employee motivation to perform safely.

Safety training

Safety knowledge and skill are thought to be pivotal in determining safety behaviour (Christian et al., 2009; Griffin & Neal, 2000) and therefore it would not be surprising to find research that demonstrates safety-training programmes improve safety behaviours. Indeed, Burke and colleagues (2002) demonstrated the superiority of depth of knowledge over breadth of knowledge in determining safety behaviour on a range of routine tasks. However, the same was not true for inconsistent or low frequency tasks, such as communicating health and safety information; neither depth nor breadth of knowledge predicted employee performance on this dimension.

Notwithstanding the importance of the quality of the training, one of the principal barriers to performance of the newly learnt knowledge and skills is the transfer of the training from the classroom to the workplace (O'Connor et al., 2008). As argued by Blumberg and Pringle (1982), opportunity is an important co-determinant of behaviour and without opportunity or encouragement, skills learnt will not be put to use. Furthermore, Parker et al (2001) demonstrated that perceptions of training adequacy are not sufficient to predict safety compliance: job control and communication quality are more highly correlated with this behaviour. Similarly, studies of behavioural safety have shown that training on its own is not sufficient to bring about improvements in safety practice indicating that individuals do not operate reflexively in response to training even in the presence of contingent rewards (Grindle et al., 2000).

Safety training needs to be part of a consistent approach to safety management (Kaplan & Tetrick, 2011); for example, if safety training is given instead of expenditure on ensuring a safe working environment, employees may resent assuming the additional burden for safety (Colligan & Cohen, 2004) again suggesting a psychological contract framework might be a more fruitful avenue to pursue.

Job security

One of the ten practices that constitute a HPWS is job security (Barling & Zacharatos, 1999). Its antithesis *job insecurity* has become an important topic of study in the age of organisational downsizing and economic austerity and is defined as, "the perceived powerlessness to maintain the desired continuity in a threatened job situation" (Greenhalgh & Rosenblatt, 1984, p. 438). The psychological consequences of job insecurity are relatively well understood and include

greater job dissatisfaction (Ashford, Lee, & Bobko, 1989), and reduced vigour at work (Cheng, Mauno, & Lee, 2013). However, the psychological consequences of job security have rarely been studied in a safety context.

In a longitudinal study (Probst & Brubaker, 2001) the cross-sectional and longitudinal analyses revealed that those who experienced higher insecurity and whose job satisfaction was lower reported reduced safety compliance. Subsequently, in a series of experiments (Probst, 2002), student participants threatened with layoffs committed more breaches of safety rules than did the controls, yet were more productive. Probst concludes (2002) that safety behaviour in the context of job insecurity is a function of resource-demand trade-offs (Eysenck & Calvo, 1992; Kanfer & Ackerman, 1989) and reduced motivation as a function of psychological contract evaluations (Rousseau, 1995) leading to perceived inequity (Adams, 1965). Individuals produce more in an attempt to save their jobs, but in order to restore balance in their psychological contract they sacrifice quality and safety compliance.

In the psychological contract literature, job insecurity represents relational psychological contract violation and has the effect of disrupting the bond with the employer but not performance (De Cuyper & De Witte, 2006). De Cuyper and De Witte suggest that performance is not part of the relational contract deal, rather it is part of the transactional contract deal and this would account for the contradictory findings in Probst et al.'s studies. This thesis examines an alternative explanation that there are dual processes in operation and breaches of a psychological contract trigger both motivational processes influencing the effort that individuals apply and attentional processes influencing the capacity individuals have for on-task attention.

Work design and emotional control

The section looks at the influence that work design has on individuals' capacity to perform through its influence of their emotional equilibrium. First, the theories are presented and then second, their empirical support is reviewed.

Introduction

A number of models have been proposed to account for the manner in which work characteristics affect employees well-being as well as their motivation including Siegrist's (1996) effort-reward imbalance and French, Caplan, & Van Harrison's (1982) person-environment fit theory, but only two models have been used by more than a handful of researchers to predict individual safety behaviours; namely, Karasek's Job Demands Control Support model (JDCS; Karasek, 1979; Karasek & Theorell, 1990) and Demerouti et al.'s Job

Demands – Job Resources model (JD-R; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). These two models are described and reviewed.

Job Demands Control Support (JDCS)

One of the established theories regarding the psychosocial impact of job design is Karasek's (1979) job demands-control model. Karasek noted that the literature on job design concentrated on decision latitude and the stress literature, which investigated the aetiology of mental strain, concentrated solely on the "stressors" of jobs and life (1979, p. 285). Karasek's contribution was to bring the two elements together and propose that job satisfaction and mental strain were a function of (1) the demands placed on the individual and (2) the discretion the individual had to meet those demands. Karasek proposed in his *job strain hypothesis* that the combination of discretion and decision latitude would lead to four types of job according to the extent to which they were at the high or low poles of both continua. Each type of job was predicted to have a different relationship with two aspects of mental strain: exhaustion and depression.

As well as the addition of the support dimension, Karasek and Theorell (1990) elaborated the JDC model to take into account the findings that "active jobs", which despite being high on demands were associated with positive outcomes. Whereas, the job strain hypothesis has received much empirical attention, the same is not true for the active – passive job distinction and the motivating and learning potential of jobs high on job demands and job control (Demerouti, Bakker, De Jonge, Janssen, & Schaufeli, 2001).

In a review of 20-years of empirical research, Van der Doef & Maes (1999) concluded that there is considerable support for the job strain and iso-strain hypotheses, but the buffering hypothesis is less well supported due to inconsistent findings for the moderating effects of job control and social supports.

Job Demands – Resources Model (JD-R)

More recently, attention has turned away from issues of control to work intensification as a consequence of organisational downsizing (Green, 2004). As jobs enlarge and survivors take on the responsibilities of their former colleagues, issues to do with role clarity, work overload, and job insecurity have begun to surface and concerns are growing over the poor health and safety outcomes for employees experiencing unreciprocated over commitment (Quinlan & Bohle, 2009).

Demerouti and colleagues' Job Demands –Resources model (Demerouti, Bakker, Nachreiner, et al., 2001), grew out of Schaufeli and Maslach's work in the area of burnout (Schaufeli & Maslach, 1993), a condition of emotional exhaustion, depersonalisation and reduced personal accomplishment. Where burnout was previously associated with the helping professions Demerouti et al. argue that, "burnout develops irrespective of the type of occupation when job demands are high and when job resources are limited because such negative working conditions lead to energy depletion and undermine employees' motivation" (p. 499).

Job demands are conceived as comprising, *inter alia*, aspects of the job that require sustained physical or mental exertion, lack of social support, skill underutilization, low job control, and poor performance feedback. *Job resources* that defend against motivational withdrawal, include job control, task variety, opportunities for skill development, and participation in decision-making; and, social resources – support from peers, colleagues and family. When resources are impoverished, in the face of high demands, individuals withdraw as a self-protection mechanism.

Where the JD-R model departs from the JDCS model, is in the relationship of the two components with outcomes: job demands and job resources are posited to act independently on exhaustion and disengagement respectively and do not interact (Demerouti, Bakker, De Jonge, et al., 2001). In addition, there is an implicit latent structure to the JDR model (Luchman & González-Morales, 2013); demands and resources are not conceived as multi-dimensional. Thus, in theory, all demands operate in the same way to tax resources and all supports operate in the same way to protect resources.

Support for the models in a safety context

Safety researchers have long been concerned at how the demands of work influence accident likelihood (Swuste et al., 2010) and the assumption that workload is an important influence on individual safety behaviour is still in evidence today. One of the most influential studies that instigated considerable interest in the design of work and the influence of stress and support on safety is Wagenaar and Groeneweg's (1987) study of 100 shipping accidents. They identified several themes that relate to this section, including the influence of situational stress on the prevalence of human processing errors and the importance of the quality of the social environment and communication for job performance. However, situational stress does not always lead to reductions in safe behaviour and increases in unsafe behaviour as will be discussed below.

Two very recent meta-analytic studies have investigated the effects of job demands on safety behaviours as well as accident outcomes. The first, takes the JD-R approach and categorises various work environment constructs as either job demands or job resources and examines their relationship with unsafe behaviour and safety outcomes as a function of how burnt out or engaged individuals are (Nahrgang et al., 2011). The other meta-analytic study (Clarke, 2012) takes a JDC approach and distinguishes between hindrance stressors and challenge stressors and investigates their relationship with near misses and injuries explained by safety compliance and safety participation. Both studies emphasise the relationship between resources and effort, however they diverge on the exact manner in which stressors or job demands on the one hand, and challenge stressors and job resources on the other, influence effort and thus performance.

First, for Nahrgang et al. (2011) the process is about demand management (Hockey, 1993); demands deplete physical and mental resources leading to exhaustion, cynicism and ultimately withdrawal behaviours because once resources are “used up” withdrawal is the only way for the individual to protect the self. The process is autonomic (physiological) and thus withdrawal is unintentional. Job resources on the other hand replenish physical and mental supplies enabling individuals to maintain attention and effort on the task at hand.

On the other hand, for Clarke (2012), safety behaviour is a function of an individual’s transaction with their environment (Lazarus & Folkman, 1984), a two-stage cognitive appraisal process in which the person first evaluates whether the environment is significant for well-being and is a potential threat or benefit, and second, to an appraisal of what can be done in order to avoid harm or to improve prospects. Performance expansion is intentional to improve potential gains. Performance decrement in one area is therefore intentional to preserve performance in another area; i.e. it is motivated behaviour.

Structural equation modelling analyses for the two studies indicate agreement in one area only: stressors have a significant negative relationship with safety compliance (risks and hazards = $-.51$; hindrance stressors = $-.25$). The other results raise two important questions about the causal mechanisms put forward and are now discussed.

The first question is in relation to the negative consequences of demands on performance. Clarke demonstrated the negative impact that hindrance stressors can have on safety participation ($-.33$), which was marginally greater than its effects on safety compliance ($-.25$). These results suggest that individuals’ appraisal of work stressors influences their motivation to perform safely. In Nahrgang et al.’s study, burnout did not explain the effect of hazards and risks on safety motivation. However, burnout did relate positively and directly to involvement in adverse events. This raises questions regarding the mechanism by which job demands affect

safety performance. Clarke's study would suggest that the stress arising from job demands reduces motivation to perform safely, whereas Nahrgang et al's study suggests otherwise.

The second question that these studies raise is in relation the positive consequences of positive aspects of the work environment on safety. In Clarke's study, challenge stressors did not show any positive benefits for either compliance or participatory safety behaviours. Individuals presented with time and workload pressures do not respond positively. Challenge stressors would appear to have no motivating effect in a safety context and thus the question remains, what does? In terms of job resources, Nahrgang et al.'s study demonstrated that safety climate (which eclipsed all other job resources) had a negative relationship with burnout (-.32) and a positive relationship with compliance (.41), which suggests that social and information support is important in minimising stress and maintaining on-task performance. However, it is not possible to say whether safety climate's effect on safety compliance is a motivational effect or simply a resource replenishment effect given they appear to have conflated attitude (engagement) and behaviour (safety compliance) in their structural model.

Taken as a whole, these results suggest that individuals' evaluations are important in relation to their safety withdrawal, but it is not clear whether this is a motivational effect or an attentional effect. Given its relationship with burnout, safety climate would appear to alleviate some of the stress that does cause safety performance decrements, but not all, as burnout predicts involvement in adverse events whereas safety climate does not. Therefore, it is not clear whether the positive benefits of good working environments are felt in terms of individuals' motivation or attention either. There is a need to clarify the processes by which individuals appraise their work environment and by which mechanisms these appraisals have their effects. This thesis forwards psychological contract theory for its ability to satisfy this need through its concepts of fulfilment and breach and how individuals evaluate their employment relationship.

Criticisms

Karasek's JDC model and its subsequent elaboration to include social supports is argued to be one of the most influential in the occupational health area, although Demerouti et al.'s JD-R model is more consistently supported (Kain & Jex, 2010). However, criticisms have been levelled at both models on a number of fronts. For the most part, these do not relate to studies examining safety outcomes, but there are others that do. Given that the meta-analyses above contained studies that deployed Karasek's or Demerouti et al.'s model, the criticisms relating to the models are discussed in turn starting with Karasek's model.

First, the nature of the demands as measured by the JDCS questionnaire has been criticised for being a mix of skill variety, job control and job complexity, which are not one and the same thing (Kasl, 1996) and second, for containing affective loaded items which confound the relationship between the stimulus (the job demand) and the response (the affect) (Wall, Jackson, Mullarkey, & Parker, 1996).

The third criticism is that most studies employ a cross-sectional design and thus it is not clear whether outcomes are indeed contingent on and not antecedent to the evaluation of the job characteristics (De Lange, Taris, Kompier, Houtman, & Bongers, 2004). Fourth, active learning hypotheses have met with mixed support and thus it is not clear how demands, control and supports interact to promote or preserve pro-safe behaviour.

Similar criticisms have been levelled at the JD-R model. First, the research literature assesses constructs using inappropriate cross-sectional methodologies. Individuals are requested to report on psychological experiences such as vigour, which are likely to be more state- than trait-like and that happened some time ago. Therefore, respondents are likely to be reporting beliefs about experiences rather than experiences themselves (Briner & Kiefer, 2005); i.e. what they remember rather than what they felt.

Finally, and as with the JDCS, there is an issue of reciprocal causation (Schaufeli & Taris, 2014). Studies have demonstrated that the relationship is not solely one-directional; accidents also influence attitudes and perceptions of emotional exhaustion (Barling, Kelloway, & Iverson, 2003a). Thus such affect-based responses may be more a function of events at work than evaluations of job characteristics.

As with personality research noted earlier, scholars in the work design area are beginning to turn their attention to within-person changes in stress and job performance (Luchman & González-Morales, 2013). Indeed, Briner, (2000) has argued that stress-performance relationships may reflect a transitory interaction of responses to events in the workplace such as psychological contract breach and thus behaviour is best understood as an emotional response to events rather than as an attitudinal response to broad, abstract job characteristics. This thesis seeks to test this proposition.

2.6.2 Leadership

A theme running through research studies is that supportive leadership protects individuals against job demands (Luchman & González-Morales, 2013; Nahrgang et al., 2011; Turner, Stride, Carter, McCaughey, & Carroll, 2012) and thereby supports their safety performance. In this section, leadership is investigated for its ability to influence employees' safety behaviour

through its effects on their motivational control. No studies into abusive aspects of leadership could be found and thus the review is not able to evaluate the influence of leaders' behaviour on individuals' emotional control.

Relational leadership

In the safety sciences, safety leadership is a relatively new topic of research which has tended to adopt a positive standpoint (Kaplan & Tetrick, 2011) and apply the relationship model that emphasises transactional and transformational processes (Bass, 1985) to explain leaders' impact on employee safety behaviour (Clarke, 2013).

Kaplan and Tetrick report that leadership is a strong predictor of safety performance and accidents and studies have shown that it has a direct relationship (e.g., Hofmann et al., 2003) as well as an indirect one through safety climate (e.g., Luria, 2008; Zohar, 2002). However, explanations regarding *how* leadership behaviour influences individual safety performance do not always match with the results from empirical studies. The section reviews support for the influence of leaders' behaviour on subordinates' safety behaviour

Transformational leadership

Transformational leaders demonstrate a distinct approach to their relationships with their followers offering individual consideration, inspirational motivation, intellectual stimulation and idealised influence (Bass & Avolio, 1994). Clarke (2013) suggests the principal mechanism by which transformational leaders influence their followers is through social exchange (Blau, 1964). When leaders show concern for the well being of their subordinates and interest in their personal and professional development, subordinates grow to like and trust their leaders. In accordance with social exchange theory, the expectation is that transformational leadership might be reciprocated with contextual (safety participation) more than task performance (safety compliance) given the response is discretionary, as has been found in the wider job performance literature (Podsakoff, MacKenzie, Moorman, & Fetter, 1990).

Transactional leadership

Transactional leadership encompasses contingent reward, management-by-exception active, management-by-exception passive and laissez-faire behaviour. With the exception of the latter, these processes involve the setting of goals, monitoring of performance and dispensation of rewards and corrections in order to ensure employee performance and effort is in the desired direction. Very few safety studies have investigated the role of active transactional leadership due in part to the negative connotations associated with the active monitoring and correction of

mistakes (Clarke, 2013) characterised by some as controlling and intrusive forms of leadership (Yukl, 1999). Yet, as Clarke suggests, active forms of transactional leadership can be important implicit signals of the priority ascribed to safety on a daily basis and thus may be more proximal determinants of behaviour than the those contained in policy documents and procedures (Zohar, 2010). Such forms of leadership should have important consequences for compliance behaviours when congruent with expectations that leaders will behave in these ways (Griffin & Talati, 2011).

Support for the relationship leadership model and safety behaviour

Clarke (2103) investigated how the two aspects of relational leadership related to safety compliance and safety participation. Her meta-analysis revealed that the two aspects of leadership did not differ significantly in their abilities to predict either form of safety behaviour.

In relation to safety compliance, Conchie, (2013) investigated the role of extrinsic motivation and found it did not explain the relationship of leader behaviours with safety compliance, whereas identified regulation (individuals act safely because it is good for them), a more autonomous form of extrinsic motivation (Deci & Ryan, 1985) did. In other contexts, Conchie reports external regulation (i.e. rewards and punishments) has been shown to erode autonomous forms of motivation governing behaviour. Indeed, rewarding intrinsically motivated behaviour can have a detrimental effect; for instance, driving behaviour deteriorated after drivers were sent an unannounced reward for not having any accidents (Harano & Hubert, 1974). In contrast, Probst and Brubaker (2001) found that extrinsic motivation "*My supervisor strictly enforces rules and regulations*", did predict safety compliance. An alternative explanation forwarded in this thesis is that the reward has to form part of the psychological contract to influence behaviour. An unexpected reward leaves individuals bewildered as to what they are supposed to do in return.

Several studies have investigated transformational leadership and the role of trust and intrinsic motivation in explaining its effects on safety behaviour (Barling, Loughlin, & Kelloway, 2002; Conchie & Donald, 2009; Zacharatos, Barling, & Iverson, 2005). These studies reveal a complex set of relationships between leadership and safety behaviour. The role of trust and intrinsic motivation, the principal mechanisms by which transformational leadership is supposed to have its effects, appear highly contingent on the behaviours in question. Conchie and colleagues (2009) found that trust did not explain the effects of transformational leadership on discretionary behaviours. Transformational leadership behaviour only led to increased safety participation when trust was high. In other words, employees only reciprocated when the relationship was already good.

Conchie (2013) also investigated the effects of leader behaviours on helping behaviours. Contrary to predictions, transformational leadership did not impact subordinates' intrinsic motivation (individuals act safely because it feels good) to engage in affiliative behaviours. Conchie posits that this may indicate that helping in safety contexts is more in-role than extra-role. Zohar, (2002a) posits that the effect of leadership on behaviour may depend on the relationship with the subordinate; some subordinates may attract more attention from their leaders than others due to their own rule-evasive behaviour (p. 162). Recent research in the emotion regulation literature suggests that leadership effects can be understood better in terms of the impact on individuals' mood (Chuang, Judge, & Liaw, 2012). The effect is greater for individuals high in negative affect thereby questioning the universal effects of leader behaviour on employee performance. Chuang et al. proffer that leadership is a dynamic process and perhaps better viewed from an intra-individual perspective. This thesis argues that the exchange is highly idiosyncratic and what is good for some employees will not be good for others because it does not form part of their psychological contract.

Criticisms

It is apparent from the studies above that there is more than one type of exchange operating in the leader – safety behaviour context. Potentially, transactional exchanges coexist with the social exchanges suggested by safety scholars. Furthermore, it is likely that there are many more highly idiosyncratic exchanges in operation between supervisor and subordinate as Zohar's and Chuang et. al.'s research suggests: different individuals attract or expect different behaviours from their leaders according to their own predispositions or situation.

The safety leadership literature also appears to have a blind spot where abusive leader behaviour is concerned. Studies have focussed on the positive, motivating aspects of leadership and not the detrimental effects that can ensue when leaders bully their subordinates. Taking a psychological contract perspective would enable the consequences of such types of supervision to be predicted (cf. Restubog, Bordia, Tang, & Krebs, 2010) as well as help explain the somewhat contradictory findings above.

As psychological contract scholars have shown, the exchanges that occur in employment relationships can contain literally thousands of items (Kotter, 1973) and thus leaders, as the primary employers' representative in these exchanges, may be responsible for delivering more than the transformational and transactional behaviours expected by their subordinates (Henderson, Wayne, Shore, Bommer, & Tetrick, 2008). Leader behaviours influence subordinates' perceptions of the fulfilment and breach of those obligations, which in turn influence their trust in the organisation (Dulac, Coyle-Shapiro, Henderson, & Wayne, 2008),

their job satisfaction (Tekleab & Taylor, 2003), and ultimately their in-role, citizenship and helping behaviours (Henderson et al., 2008).

2.6.3 Safety climate

Barling and Hutchinson (2000) assert that when employees perceive management is genuinely concerned about their safety, rather than merely seeking to minimise costs or comply with legislation, and, when employees feel they are treated as resources rather than commodities (Gaertner & Nollen, 1989), they will trust in management and will be more organisationally committed. When their perceptions agree, this is termed the safety climate. The next section reviews the ability of safety climate to explain individual safety behaviour.

Following Piper Alpha and the Chernobyl nuclear disaster in the late 80s, researchers turned their attention to the culture of an organisation and management practices as an important source of influence on employees' safety-related behaviour (e.g., Reason, 1990; Reason & Reason, 1997). The term *safety culture* was coined to describe those aspects of organisational culture that relate to safety (Guldenmund, 2010).

More recently, studies have focused on the concept of safety climate (Neal & Griffin, 2006), which Guldenmund refers to as the analytic approach to understanding safety culture. However, as with research into organisational culture and organisational climate, there appears to be considerable debate about the distinctiveness of the two concepts of climate and culture and a lack of consensus as to the contents of each (Guldenmund, 2000). As a result, definitions of safety culture and safety climate often refer to the same constructs and scholars from the cultural position question the appropriateness of applying psychometrics to the study of individuals' subjective experiences of their organisation's actions (Guldenmund, 2010).

Much of the research into safety culture and safety climate is from the social psychological tradition. It rests on the assumption that organisational complexity can be reduced to a limited, universal set of key dimensions and these can be measured in questionnaire surveys (Guldenmund, 2000). If these methodological assumptions were correct, we would expect the same key dimensions to appear regardless of context or population. Yet, when Coyle, Sleeman, and Adams, (1995) sought to establish the degree of correspondence between the safety climate of two highly similar organizations, they found the two groups of employees did not perceive occupational health and safety issues in the same way.

Cooper and Phillips (2004) argue that when we use the word *key*, as in key dimensions of safety climate, we need to focus on those factors that predict actual on-going safety performance. Empirical studies that have attempted to validate safety climate in this way, whether

concurrently (at the same time as the instrument was distributed) (e.g., Glendon & Litherland, 2001; Griffin & Neal, 2000; Neal et al., 2000) or predictively (at a future date after the instrument has been distributed) (e.g., Torp & Moen, 2006) have met with limited success and relationships between perception of climate and perceptions of behaviour are modest at best (Cooper & Phillips, 2004).

In Cooper and Phillip's own predictive study, perceptions of the importance of training, as measured by a safety climate questionnaire, predicted actual levels of safety behaviour. However, the magnitude of change in perceptions of the importance of safety did not correspond to the magnitude of change in safety behaviour. The authors themselves conclude that the climate-behaviour relationship is not clear-cut. Indeed, it has been ventured that safety performance and safety climate may be independent of one another, but linked under an umbrella concept such as culture (Glendon and Litherland, 2001).

Criticisms

The discrepancies raise a number of important issues regarding the relationship of safety climate with safety behaviour. First, Cooper and Phillips report (2004) that correlations between two-perceptual constructs such as safety climate and self-reported behaviour may over-estimate relationships. Examination of the rating scales deployed in studies reveals that individuals are asked to rate their agreement with behavioural statements rather than the frequency with which they perform the behaviours. This is a significant issue. Dalal (2005) asserts that agree-disagree response options may not measure behaviour at all. Instead, he proffers, these scales are measuring attitudes to behaviours. Attitudes do not take into account the opportunities and constraints afforded by the context, and thus responses are more likely to reflect behavioural intentions rather than actual behaviour (p. 1250).

Second, a significant issue for safety climate research is the direction of causality. Beus, Payne, Bergman, and Arthur (2010) illustrated that the injury → climate relationship is much stronger than climate → injury relationship. Yet, in Christian and colleagues' (2009) meta-analysis less than 10% of studies were longitudinal and even fewer use panel designs. This raises questions regarding the role of safety climate in safety behaviour.

Third, a distinction is made in the literature between safety climate (group level construct) and psychological climate (individual level construct) (Guldenmund, 2000). When individuals agree, climate perceptions are aggregated to give group safety climate and these group level data have stronger relationship with injuries than psychological safety climate. Recent studies have shown that perceptions of leadership are both a cause (cf., Zohar & Tenne-Gazit, 2008) and

a consequence of safety climate (cf., Barling et al., 2002) leading some to question whether it is a culmination of shared cognitions or social consensus (see Zohar, 2010 for a discussion); or, whether it is an attribute of people (i.e. leaders) rather than organisations (Guion, 1973).

The problem this poses is that it is not clear therefore what mechanism is in operation that influences safety behaviour. Similarly, it is not clear whether the perceptions are regarding the quality of the relationship with the organisation or the nature of the exchange with its key representatives. Without knowing how safety climate operates, it is not clear which HR practices should be changed in order to improve safety climate (Neal & Griffin, 2004) or indeed which inducements the organisation should offer to support safe working. Thus the question remains, how useful it is to know that there is a relationship between shared perceptions and behaviour if one cannot use that information to predict and change on-going variation in that behaviour?

An alternative explanation is that the climate- (or attitude)-behaviour-performance link is highly idiosyncratic and studies that seek to pool self-reported perceptions of safety and view the resultant subject variance as error are not seeing the wood for the trees. Groups of individuals may share similar perceptions of the priority ascribed to safety in their organisation, but whether their perceptions influence their behaviour in the same way as it influences their peers' behaviour, will be dependent on their psychological contracts. As Walker and Hutton argue, "Psychological contracts may provide the cognitive basis to the development of safety attitudes and behavior" (2006, p. 434). Psychological contracts and their fulfilment or breach may also govern how those attitudes and behaviours are enacted on a day-to-day basis in safety performance terms.

2.7 Conclusions

This chapter has reviewed the safety performance construct and both individual and situational determinants of safety behaviour. The psychological safety performance literature is relatively young in comparison to other fields of organisational behaviour with significant advances only being made in the last decade.

The first of these was to separate safety performance into the individual behaviours and the organisational outcomes that are the results of those behaviours (i.e. accidents). However, subsequent efforts to define individual safety performance and investigate the dimensionality of safety behaviour would appear to have stalled with more emphasis being placed on the predictors of safe working than on the construct of safe working itself.

Safety behaviour has largely been conceived of as a bi-dimensional construct, reflecting the task–contextual performance dichotomy of the job performance literature. However, the distinction between compliance and contextual safety on the basis that one is mandatory determined by safety knowledge and the other discretionary determined by safety motivation would appear unreliable. This differentiation overlooks the debates taking place in the wider performance literature that propose additional classes of behaviour that are adaptive and function to improve affect or replenish resources as well as achieve goals.

Safety researchers also appear to be avoiding the uncomfortable truth that people also contravene organisational prescriptions and engage in unsafe behaviour. Very few studies have examined the dimensionality of unsafe behaviour and its determinants. Even fewer have examined unsafe behaviour alongside safe behaviour and thus we do not know the ratios with which individuals engage in productive and counterproductive activity. In addition, the preponderance of cross-sectional studies that focus on between rather than within-person variability prevents us from knowing the sum contribution of safety value that employees generally make to their organisations' safety performance. Nevertheless, earlier studies of human error have given us the insight that behaviour can have unintentional as well as intentional safety consequences and the psychological underpinnings of each are likely to be different.

The chapter also reviewed the principal theories and models used to account for individuals' safety behaviour. The review was organised into the individual difference and situational causes of safety behaviour. Historically, personality differences were thought to explain people's accident-proneness, but this thinking has largely proven to be flawed. More recently, the five-factor model has been applied to explain safety behaviour. However, for some factors (e.g. conscientiousness), the predictions and findings are largely intuitive and for others (e.g. neuroticism) proposed relationships with task engagement do not appear. Consequently, broad-based personality traits help little in explaining how to improve safe behaviour and reduce unsafe behaviour. Nevertheless, the job performance literature does offer insights into how individual differences have their effects on behaviour suggesting that within-person self-regulatory motivational and emotional-control processes influence in-role behaviours.

In the section on situational determinants of safety behaviour, the literature was loosely divided into work characteristics that motivate and work characteristics that cause strain. A number of theories were considered that propose mechanisms by which job demands, autonomy, resources, leadership and safety climate affect safe and unsafe behaviour.

In relation to strain and safety behaviour, the results are very mixed. Studies have found that job demands (workload, hazards, risks, complexity, role ambiguity, etc.) both do and do not negatively affect safety compliance and contextual safety behaviour. Similarly, job resources (job control, social support from co-workers, leaders and the organisation) have shown mixed results; in some studies, positive effects on safety compliance are reported and in other studies the results are equivocal, particularly for contextual safety behaviour. Where unsafe behaviour and involvement in adverse events, injuries and accidents are concerned, the findings are a little less confused. In particular, job demands would appear to be related to increased rule violation through engagement and group safety climate appears to protect individuals against accident involvement through safety compliance.

However, issues to do with reciprocal causation exist in both research areas and reverse causality cannot be excluded. Furthermore, the safety climate literature is largely a-theoretical and thus it is not clear what organisations should do to improve the perceptions of individuals and thereby their safety behaviour.

Lastly, the dominant approach to investigating situational determinants of safety behaviour has been at the between-persons level. With few exceptions the operational measures of phenomena such as strain and engagement are tapping into beliefs about psychological states rather than experiences of them. It is also unlikely that employment contexts are static and unchanging in character and studies at the within-person level have shown that job characteristics and leadership exchanges vary over time, as do the energy and emotions that individuals experience as a result. It is unsurprising therefore, that broad-based job characteristics and perceptions of organisational attributes, while interesting and important phenomena, do not relate consistently to safety performance. The safety literature has yet to countenance the idea that individual safety behaviour can vary temporally as a function of the interaction between individual propensity to deploy motivation and emotion regulatory strategies and workplace events, such as psychological contract breach.

All safety behaviour of interest to this thesis occurs within the confines of an employment relationship, which is comprised of dynamic reciprocal exchanges between organisations, their representatives and employees. However, both the individual difference and situational accounts of safety performance imply fixed, stable and between-person mechanisms by which traits and perceptions translate into behaviour. Consequently, theoretical accounts have found inconsistent and equivocal support.

Throughout the course of the review, psychological contract theory (PCT) has been forwarded as an alternative interpretation due to its ability to explain the findings that the other accounts

have not. However, this has been ad-hoc. Nevertheless, the review highlighted that both personality traits and broad-based work characteristics are lacking in their ability to consistently explain between-person variation in safe and unsafe behaviour. Instead, the section discusses ways in which PCT and its concepts of breach, fulfilment and violation could help explain findings; for example, the success of behavioural-based safety management might be reliant on management acting in accordance with employees' beliefs in a just culture. The review also exposed a blind spot with respect to *on-going* safety behaviour; neither individual difference nor situational accounts appear to have considered day-to-day variations in individuals' safety performance and the mechanisms that might underpin it. The review concluded that distal and unvarying personality factors might not reliably account for on-going safety behaviour, but the self-regulation of motivation and attention following breach of the psychological contract could. Accordingly, the next chapter systematically evaluates psychological contract theory for its ability to explain the on-going variation in individual behaviour and thus its utility in a safety employment context.

Chapter 3. The psychological contract as an explanatory framework for employee behaviour

3.1 Introduction

The primary aim of this thesis is to use the psychological contract to explain safety behaviour. Thus, the purpose of this chapter is to explain what the psychological contract is and to review how it has been used to account for employee performance. The second aim of the thesis relates to psychological contract theory itself. In connection to this, the chapter seeks to explore the manner in which it regulates behaviour. The focus is on the evaluation of the exchange and the nature of the zone of acceptance that determines when and how fulfilment and breach perceptions translate into behaviour.

The chapter unfolds as follows. First, it sets about defining the psychological contract, but rather than simply presenting definitions it traces how the dominant psychological paradigms operating at the time have influenced development of the concept. The purpose of this review is to bring us up-to-date with regards our understanding of how the psychological contract operates, of how psychologically engaged employees are in their employment relationship, and of how cognition and affect determine behaviour in response to psychological contract events.

Second, the chapter considers what is in a psychological contract and how the contents explain behaviour. The primary focus is on explaining behaviour after the psychological contract has been formed and not how the psychological contract develops.

Latterly, the chapter focuses on how employees evaluate psychological contracts and what impact both fulfilment and breach of obligations by employers has on their work behaviour. The discussion broadens to consider two potential regulatory mechanisms that might explain the effects of fulfilment and breach on behaviour.

It is acknowledged that the psychological contract as a construct for explaining attitudes and behaviour in work settings has been criticised on several fronts: ideologically (Cullinane & Dundon, 2006), conceptually (Guest, 1998), and methodologically (Conway & Briner, 2005). However, while this chapter contains some analysis, the concluding chapters following the empirical studies discuss these criticisms in greater depth and provide a more thorough critique of the psychological contract concept.

3.2 The psychology of the employment relationship

The psychological contract as a construct for understanding employee behaviour at work can be traced back to studies as early as the 1930s; for example, Barnard (1938) wrote of his observations about the factors that motivate employees to accept an organisation's goals (Simon, 1979). The actual term psychological contract was not used until 1960 (Conway & Briner, 2005). Argyris (1960) wrote of the psychological work contract as an agreement that evolved between foremen and employees wherein productivity was exchanged for passive leadership.

The history of the development of the psychological contract construct has been presented in depth elsewhere (cf., Conway & Briner, 2005; Roehling, 1997) and is outside the scope of this thesis. Rather, this section will examine a range of definitions (Table 3.1) against the context of the time they were developed and discuss the function the psychological contract performs for the individual, reviewing in brief the fundamental components of these definitions according to the paradigm under which they were developed. The section concludes with a comment on the level of psychological engagement associated with psychological contracts and the level of conscious awareness that individuals have regarding its contents. Lastly it presents the definition that is taken forward for the remainder of the thesis.

3.2.1 What is the psychological contract?

As stated earlier, Argyris first used the term *psychological work contract* in 1960 to characterise the implicit exchange relationship between foremen and employees, but references to psychological contracts can be traced as far back as writings in the Bible (Rousseau, 1989). Despite the very early origins of the psychological contract, this review will start with the era in which large numbers of individuals were entering into employment at the turn of the last century, as this is where contemporary conceptualisations of the construct are believed to have their origins.

Rational-economic conceptualisation

The era in between and post the World Wars was characterised by rapid industrialisation, new systems of control over workers, and the growth of management (Holloway, 1991). Individuals left their craft way of life and entered into an employment relationship. Simon (1979) proposed that individuals would prefer this form of contract where they have to submit to the authority of management, over other types of contract, because employment reduces the uncertainty in comparison to an artisan way of life.

Table 3.1

Summary of descriptions and definitions of psychological contracts from different paradigmatic perspectives.

Paradigm	Definition	Reference
Rational Economic	Those participants in an organisation who are called its employees are offered a variety of material and non-material incentives, generally not directly related to the attainment of the organization objective ... in return for their behaviour during the time of their employment. In joining the organization, he (the employee) accepts an authority relation, i.e. he agrees that within some limits (defined explicitly and implicitly by the terms of the employment contract) he will accept as the premise of his behaviours orders and instructions supplied by the organisation	(March & Simon, 1958, p. 90)
Humanistic	Since the foremen realize the employees in this system will tend to produce optimally under conditions of passive leadership, and since employees agree, a relationship may be hypothesized to evolve between the employees and the foremen which might be called the 'psychological work contract'. The employee will maintain the high production, low grievances, etc., if the foreman guarantees and respect the norms of the employee informal culture (i.e., let the employees alone, make certain they make adequate wages, and have secure jobs)"	Argyris, 1960, p. 97
Humanistic	The psychological contract is a series of mutual expectations of which the parties to the relationship may not themselves be even dimly aware but which nonetheless govern their relationship to each other ... The psychological or unwritten contract is a product of mutual expectations. These have two characteristics: (a) they are largely implicit and unspoken, and (b) they frequently antedate the relationship of person and company.	(Levinson, Price, Munden, Mandl, & Solley, 1962, p. 21)
Humanistic	...the psychological contract is an implicit contract between an individual and his organization which specifies what each expect to give and receive from each other in their relationship	Kotter, 1973, p. 92
Information Processing	The term psychological contract refers to an individual's beliefs regarding the terms and conditions of a reciprocal exchange agreement between the focal person and another party. Key issues here include the belief that a promise has been made and a considerations offered in exchange for it, binding the parties to some set of reciprocal obligations	Rousseau, 1989, p. 123
Information Processing	The psychological contract is a mental model of the employee-organization relationship that serves to interpret events and that is the basis for action and subsequent attitudes	(Schalk & Roe, 2007, p. 171)
Information Processing	The psychological contract concerns the workers' beliefs about what employers owe to them (i.e. employees' entitlements), and what they want to reciprocate (i.e. employees' obligations)	(De Cuyper, Van der Heijden, & De Witte, 2011, p. 1487)

Individuals are satisfied to submit to this authority relation and permit their behaviour to be determined by management, "within some zone of indifference or acceptance" (Simon, 1979, p. 502) for security and a share of the surplus. Survival of this relationship and the organization is dependent on the participants' "willingness to remain in the system" (Barnard, 1938), and this Simon (1979, p. 502) argues, is dependent on the balance of inducements provided by the organization to its participants against their contributions to the organization's resources.

Simon's thinking is informed by the debates at the time regarding normative decision theory and decision-making under uncertainty. His contention is that human decision-making is not characterised by perfect rationality, but by *bounded rationality*. As such, individuals on entering an employment relationship can never know all the alternative choices open to them, cannot predict the events that will happen, and thus cannot calculate the consequences of actions to arrive at an optimal decision whether it is best to leave or to remain. Instead, decision makers engage in a limited search of alternatives, the extent of the search being determined by their aspirations, and when an alternative is found that is satisficing, the search is terminated. Moreover, he maintains, that these aspirations are not static, but "rise and fall in consonance with changing experience. In a benign environment that provides many good alternatives, aspirations rise; in a harsh environment, they fall" (Simon, 1979, p. 503).

The extent to which the terms of the psychological contract are *known* by individuals and how individuals come to hold beliefs that determine their limits of acceptability is contested. Simon maintains heuristics stored in long-term memory guide the search and satisficing criteria, suggesting the aspirations exist prior to entering the employment relationship and grow when that environment is beneficial and contract when it is detrimental. Recent accounts argue that the contents are *known* for it is the promises made by the employer that determine what the psychological contract contains and it is the current employing organization that "shapes" the content of the psychological contract (Rousseau, 1995, p. 9).

Humanistic conceptualisation

Work intensification and the division of labour, which typified the employment context in the middle of the 20th century and which should have induced workers to produce more, had the opposite effect. Alienation from work (Pearlin, 1962) and poor mental and physical health (Kornhauser, 1965; Turner & Lawrence, 1965) became evident and the rational-economic explanation for worker motivation was rejected. The human relations paradigm gained prominence and such was its influence that its assumptions can still be seen in the psychological contract literature today. Attitudes, such as job satisfaction, came to be seen as the intervening variable between working conditions and outputs and "the sentimental worker" was born (Holloway, 1991, p. 71). Workers were credited with feelings and needs.

The assumptions that emanate from this time are reflected in the psychological contract definitions of Argyris (1960), Schein (1965) and Levinson and colleagues (Levinson et al., 1962). Each suggest that the content of the psychological contract is socio-emotional in nature, that workers enter employment with unexpressed expectations that their needs will be fulfilled and include the need for autonomy or independence, psychologically rewarding relationships and

the ability to cope with change (Levinson et al., 1962, p. 38). These socio-emotional needs in turn drive the expectations, for example, regarding the work roles they will be required to perform and can predate the relationship.

The principal contribution of this era is that of the implicit nature of psychological contracts, the enlargement of terms to include socio-emotional aspects, and an understanding of how the relationships between employer and employee evolve or are disrupted through the mechanism of reciprocation. However, many aspects of the definitions are rested on the assumptions of a stable employment context, as evident in the accounts where reference is made to the company's expectations that, "satisfactory employees ... remain with it for a long period of time" (Levinson et al, 1962, p. 35) and Argyris's reference to the development of an informal work culture. These assumptions may not hold true for contemporary workers many of whom have much more tenuous or discontinuous employment contracts; over 25% of workers in the UK are on part-time contracts (Eurostat, 2012), do not belong to a union (union membership density fell from 39% in 1989 to 26% in 2011 [Brownlie, 2012]), and work in contexts such as call centres, which do not afford the development of social relationships (Chambel & Alcover, 2011).

This raises the question as to whether agreements between organizations and employees develop in all work contexts in the manner described by Argyris, Schein and Levinson. More recent definitions emphasise the subjective nature of psychological contracts, suggest mutuality is in the "eye of the beholder", and question whether mutuality "in fact" can ever exist due to "differences in experience, power, and expertise" (Rousseau, 2003, p. 235).

Information processing conceptualisation

The employment context in the 1980s is characterised by significant disruptions in the continuity of employment as organizations sought to increase their flexibility and competitiveness in the face of difficult economic circumstances. Permanent employees were reduced in number in favour of temporary workers who could be hired and fired as the work demands dictated. For those that remained on permanent contracts, the Core of the now *Flexible Firm* (Atkinson, 1984), job roles enlarged and working hours increased as companies sought to redistribute the work previously performed by the laid-off (Moskal, 1992). The organizational research community responded to this situation and sought increasingly to explain, using the psychological contract concept, both the behavioural reactions of the employees who remained with their old agreements in tatters (e.g., Parks & Kidder, 1994) and those who had been cast out (e.g., Parks & Schmedemann, 1994). While Guest (1998) has argued that this expedient approach to industrial relations research does not help develop robust theories, he nevertheless acknowledges the psychological contract concept captures the

“spirit of the times...” and “...the individualizing of the employment relationship” (Guest, 1998, p. 660)

Denise Rousseau is credited with a fundamental reappraisal of the psychological contract concept at this time and her essay on the subject (Rousseau, 1989) spawned the research interest that is still in evidence (Roehling, 1997). Drawing on the work on contracts of Farnsworth (1982) Murray (1974) and Macneil (1985), Rousseau emphasises both the subjective and promissory nature of all contracts and in particular psychological contracts. Psychological contracts are in “the eye of the beholder” and for reasons of the lack of human cognitive capacity to appraise all information in a promise, and the way in which that information is presented or framed, the parties to the contract will not necessarily see its terms in the same way (Rousseau, 1989, p. 122).

Echoes of the rational-economic conceptualisations are thus present in Rousseau’s account in that subjectivity is rooted in bounded rationality. As the relationship endures through successive interactions, the parties become more committed to maintaining the contract, but not for reasons of converging agreement on its terms or a move towards perfect rationality. Rather, it is a contribution on the part of an employee followed by a belief that the organization is obligated to reciprocate that serves to bind the employee to his or her organization in a psychological contract (Rousseau 1989, p.124).

The information processing account of human behaviour is influential in psychology at this time, in particular, social cognitive (Bandura, 1989) and social learning theory (Bandura, 1977). In the psychological contract literature, the social information processing account, a synthesis of the social cognitive and social learning theories (Arnold, Robertson, & Cooper, 1991), is particularly influential.

The social information processing approach proceeds from the fundamental premise that individuals, as adaptive organisms, adapt attitudes, behavior, and beliefs to their social context and to the reality of their own past and present behavior and situation. This premise leads inexorably to the conclusion that one can learn most about individual behavior by studying the informational and social environment within which that behavior occurs and to which it adapts (Salancik & Pfeffer, 1978, p. 276).

Rousseau’s idea that employees develop beliefs around promises made and reciprocal obligations is firmly embedded in this paradigm. Promises serve to communicate information to the individual regarding future behaviours that will be rewarded, thereby setting up expectations or beliefs that if performed, that behaviour will indeed be recompensed. Moreover, promises that emanate from *overt* communications will be more powerful in this regard than mere suggestion, but to form part of a contract, they need to be paid for. Therefore,

the temporal arrangement is generally held to be that of promise followed by behaviour and then reward. The more consistent the pattern, the stronger the belief an individual will hold regarding the exchange of contributions and inducements (Rousseau, 1989).

According to the social information processing account, individuals develop mental models or schema of their social worlds both to organise knowledge and past experience and to interpret new information and experiences. Schema can also contain scripts, or action sequences, that not only guide individual behaviour but also allow the individual to understand and anticipate the behaviour of others (Abelson, 1981). Thus, psychological contracts in this conceptualisation are mental models of the employment relationship that reduce the need to continually monitor the environment to gather information and process anew. Experiences lead to the development of beliefs (schemata) around all possible exchanges in an employment relationship binding what is expected from the organisation with what is produced by the individual and governing behaviour (action scripts) (Rousseau, 1995, p. 27).

The notion of promissory-based psychological contracts was developed in an era where employees were being confronted with redundancy after long periods of employment with the same employer. In the period between 1991 and 2000, Robinson's paper entitled *Trust and breach of the psychological contract* (Robinson, 1996) is the most often cited paper on psychological contracts (Social Science Citations Index, 29-8-12) reflecting the concern over the impact that the structural changes were having on the well-being of individuals. However, in keeping with the social information processing account, these emotional reactions to psychological contract breach are deemed the natural consequences of individuals having to contend with schemata and scripts that are no longer valid in the new employment context in which they find themselves (Morrison & Robinson, 1997). Despite the conviction with which Rousseau and others hold the assumption that cognition precedes affect, not all subscribe to this view. The alternative account offered is that affect can and does precede cognition and can indeed be independent of thinking:

Affect is always present as a companion of thought, whereas the converse is not true for cognition... it is entirely possible that the very first stage of the organism's reaction to stimuli and the very first elements in retrieval are affective. It is further possible that we can like something or be afraid of it before we know precisely what it is and perhaps even without knowing what it is. And when we try to recall, recognize, or retrieve an episode, a person, a piece of music, a story, a name, in fact, anything at all, the affective quality of the original input is the first element to emerge. To be sure, the early affective reaction is gross and vague. Nevertheless, it is capable of influencing the ensuing cognitive process to a significant degree (Zajonc, 1980, p. 154).

Simon's spoke of workers' "zone of indifference or acceptance", implying that individuals start their employment relationship from a position of uncaring as to what they will be asked to do

principally out of ignorance. As information is gathered regarding the exchange, the more the worker comes to understand what is expected of him or her and can appraise whether his or her aspirations are being satisfied. Rousseau (1989) holds that over time successive exchanges are incorporated into existing schemata created when promises are made. These schemata are resistant to change and govern behaviour in an automatic fashion until such times that the individual realises what was promised has not been forthcoming. The realisation generates unpleasant feelings, which motivate the individual to act (Shore & Tetrick, 1994).

For those that assert the primacy of affect, it is not information that influences the appraisal, rather it is affect – how the individual *feels* about what they are being asked to do that determines the appraisal of the exchange. They remain indifferent or accepting until such times as a threshold is reached. In the words of Wundt (1907),

When any physical process rises above the threshold of consciousness, it is the affective elements which as soon as they are strong enough, first become noticeable. They begin to force themselves energetically into the fixation point of consciousness before anything is perceived of the ideational elements. They are sometimes states of pleasurable or unpleasurable character, sometimes they are predominantly states of strained expectation. . . . Often there is vividly present . . . the special affective tone of the forgotten idea, although the idea itself still remains in the background of consciousness. . . . In a similar manner . . . the clear apperception of ideas in acts of cognition and recognition is always preceded by feelings, (p. 243-244; cited in Zajonc, 1980).

This issue goes to the very heart of the promissory nature of the psychological contract. If individuals are motivated to behave, respond, retaliate, commit to their organization, not because of what they think about the promises they have been made and have paid for, but because of how they feel towards the behaviour or actions of the organization, then this would suggest a much more archaic system is regulating behaviour within the employment relationship, a system that is founded on experiences that predate the employment contract, predate any cognitions regarding promises made by the employer, and one that is largely outside of conscious awareness as the pre-Rousseau scholars have recently argued (see Meckler, Drake, & Levinson, 2003; and rejoinder from Rousseau, 2003).

Affective neuroscientific conceptualisation

Rapid change, restructuring and downsizing are continuing features of the contemporary employment and organizational landscape (Kickul, Lester, & Finkl, 2002). The world of work in the 21st century is characterised by a growing trend towards jobs high on uncertainty and unpredictability and in some instances, personal risk (Smith, 2001; p. 7, cited in Marler, Woodard Barringer, & Milkovich, 2002; p. 426). In the organizational sciences an “affective revolution” (Barsade, Brief, & Spataro, 2003, p. 14) has been witnessed and a new paradigm has

emerged in which affect, emotions, and moods have taken centre stage as the critical determinants of employee attitudes and behaviour (Barsade & Gibson, 2007). In part, this is due to the development of technologies that can image the intact brain and enable neuroscientists to tap into the unconscious and ascertain how emotions both cooperate and compete with cognitions to govern behaviour (Cohen, 2005).

A shift in the psychological contract literature is also becoming apparent, not in terms of defining psychological contracts, but in terms of explaining the effect of changes to the employment relationship and how these impact the psychological contract and subsequent experiences and behaviours. A review of Table 3.1 reveals that definitions of the psychological contract have not changed substantially from Rousseau's reconceptualization and continue to emphasise employee perceptions of reciprocal obligations. However, the theoretical explanations put forward to explain how psychological contracts relate to employees' attitudes and behaviours are changing to place more emphasis on the role of affect and its influence on cognition and behaviour. This is particularly in evidence in the contemporary psychological contract literature, where breach is separated from violation; i.e. the perception is differentiated from the emotional reaction (Morrison & Robinson, 1997) and reference is made to Weiss and Cropanzano's (1996) Affective Events Theory (e.g., H. Zhao et al., 2007) and theories of emotion regulation (e.g., Bal & Smit, 2012).

Where the extant psychological contract literature is lagging behind neuroscience is in its treatment of affect as a stable mental phenomenon available for conscious recall from long-term memory, an assumption that is questioned with the benefit of neuroscience (cf. Tulving, 2002). Affect is now recognised as transitory and volatile (Beal & Weiss, 2003); we might remember that something was exciting, but we cannot re-experience the feeling of excitement or accurately report the extent of that feeling (Robinson & Clore, 2002).

The question remains as to how definitions might change in future to integrate the old and new perspectives as well as incorporate new knowledge regarding the role of the unconscious and how implicit and momentary affect influences individuals' psychological functioning in the context of an employment relationship. Whereas, the humanistic scholars recognised the importance of affect and unconscious needs, they did not have the tools to study them. Whereas, contemporary psychological contract researchers have the tools, they have underplayed the importance of affect in determining cognitions and misrepresented it as a stable phenomenon. Although, it is noted that neuroscientific studies have been criticised recently for low statistical power and overstated claims (e.g. Lindebaum, 2016; Lindebaum &

Jordan, 2014), this thesis seeks to establish if psychological contract definitions need updating and integrating in light of recent insights into the unconscious.

3.2.2 Summary and conclusions

The preceding sections covered substantial ground in considering the definitions of the psychological contract and the paradigms that have influenced its conceptualisation. This section will summarise the points made above and signal the direction that this thesis will take in regard to its conceptualisation of the unfolding psychological contract.

The unfolding psychological contract

Promises are positioned centrally in psychological contract definitions (Montes & Zweig, 2009) in the late period of the psychological contract literature. Furthermore, this focus has been on *explicit* promises arising from overt verbal communications rather than implicit promises that have more ethereal sources such as unconscious drives, which were the focus of the early literature. While definitions from both periods have elements in common, the exchange for example, the implicit and unconscious nature of the beliefs governing the psychological contract is still disputed (Conway & Briner, 2009). Rousseau rejects the clinical perspective and the idea that unconscious needs are the fundamental basis of the psychological contract suggesting that the clinical conceptualisation of needs (Meckler, Drake, & Levinson, 2003) is too limited (Rousseau 2003), whereas Meckler et al. (2003) reject the promissory nature of psychological contract beliefs, suggesting that the science on which these accounts are based is flawed given that studies seek to gather self-reports of psychological contract beliefs when psychological contracts are “largely *not* perceived” (Meckler et al., 2003, p. 220, italics in the original).

While this debate is as yet unresolved, recent advances in neuroscience may shed light on our understanding of the role of the unconscious and implicit aspects of the psychological contract, which may in fact indicate that both accounts are correct. In what they term “the implicit revolution”, Barsade, Ramarajan, & Westen, (2009, p. 137) elucidate the manner in which implicit memory and implicit affect can govern behaviour without the conscious awareness of the individual concerned. Our brains are a collection of mental phenomena such as feelings, thoughts, memories, goals, and emotions, which are connected in associative neural networks. When one aspect is activated – thoughts, a feeling - all aspects connected with that node are also activated, and those irrelevant or unconnected are deactivated or inhibited. Whether this mental content is dormant, conscious, or unconscious depends on how recently it was activated. According to Barsade et al, the state of activation can range from “relatively dormant (not recently enough activated to influence thought, feeling, or behaviour extensively) to

unconscious (active but still latent) to conscious (active and accessible to conscious introspection)" (2009; p.137).

For psychological contract theory, the question remains as to where the beliefs governing individual's behaviour fall on this spectrum from dormant to active and to what extent the mechanisms regulating individual behaviour in an employment relationship are cognitive and conscious as well as emotional and unconscious in nature.

This thesis adopts the position that the psychological contract is rested on the obligation to reciprocate and the exchange will incorporate *both* needs and promises in keeping with the neuro-affective perspective discussed above. Accordingly, the following represents the working definition of the psychological contract chosen for this thesis:

Psychological contracts are an individuals' belief regarding reciprocal obligations...The promise of reciprocity in exchange for some action or effort is the basis of the contract. Promises need not be made explicitly... expectations formed during interactions regarding future patterns of reciprocity can constitute a psychological contract (Rousseau, 1990, p. 390).

This definition is chosen as it recognises the basis of the psychological contract as the belief in the obligation to reciprocate. The definition also reflects the implicit as well as the explicit nature of the contract as well as noting that patterns of behavioural interaction give rise to expectations. Thus, it goes some way to incorporate the clinical or humanistic perspective of the employment relationship in recognising that the belief in reciprocation may be unconsciously formed. Whereas Rousseau's conceptualisation of the implicit downplays employee needs, this thesis maintains a broader understanding and recognises that the unconscious can influence exchange interpretations as can the experience of past patterns of exchanges. This is important for this thesis given its focus on the unfolding psychological contract. The next section discusses how the psychological contract unfolds and how that unfolding process relates to behaviour.

Two unfolding processes

The foregoing discusses whether psychological contracts are founded on conscious perceptions regarding promises (able to be stated) or unconscious needs and emotions (unable to be stated) as well as discussing the extent to which the zone of acceptance represents a conscious or an unconscious appraisal of the exchange. In addition to outlining different conceptualisations of the unfolding psychological contract, the review above also illustrated that the psychological contract can unfold in one of two ways; employees' needs and beliefs in reciprocal obligations can be met, or they can be unmet. In the contemporary literature, when employers honour their

obligations it is referred to as fulfilment and when they fail to meet their obligations, it is referred to as breach.

The different paradigms have different interpretations of how fulfilment and breach occur. For the rational-economic conceptualisation, individuals engage in a conscious process of weighing up the balance of contributions versus inducements. When the balance is equitable, employees choose to remain and when it is inequitable the employee leaves “the system” (Barnard, 1938). For the humanists, employers have the obligation to satisfy needs, of which the employee may only be dimly aware (Levinson et al., 1962). Behaviour is driven unconsciously by need satisfaction in an on-going, unfolding manner. When needs are unmet, employees experience anxiety and engage in behaviours designed to relieve the distress. For the information processing conceptualisation, the psychological contract schema regulates behaviour automatically until such times that a breach is detected, whereupon individuals refer their conscious perceptions of the employer’s performance back to schemata held in long-term memory (Shore & Tetrick, 1994). It is the subsequent appraisal and attribution process that determines the behavioural response (Morrison & Robinson, 1997). For the neuroscientists, a distinction is made between two types of memory structures, one that encodes new, but similar experiences in line with existing schema, schema that allow the “selection of contextually optimal behaviour” (Ghosh & Gilboa, 2014, p. 108); and, the other that records autobiographical events and allows us to “remember past happenings” (Tulving, 2002, p. 2). Individuals have emotional thresholds, such that when exceeded, trigger the activation of a memory, the mental content of which can be a thought, a feeling or behaviour (Barsade et al., 2009). The activated feelings can either facilitate or inhibit appropriate behaviour (Weiss & Cropanzano, 1996) and the activated thoughts can affect an individual’s capacity to respond (Hockey, 1993).

Whereas contemporary researchers rely on definitions that emphasise the belief in reciprocal obligations, this thesis goes further. It proposes and tests two possible pathways that capture the impact of the unfolding psychological contract outlined above on individuals’ motivational and attentional experiences. It is argued that the unfolding psychological contract; namely fulfilment and breach, impinges on individuals’ motivational and attentional experiences and it is these that determine employees’ aspirations, attitudes, and ultimately their behaviours. This thesis seeks to establish if this is an accurate account of the unfolding psychological contract where safety behaviour is concerned.

The next section examines how the unfolding psychological contract has been used to account for behaviour, first exploring why reciprocation and its interruption may be inadequate, before moving to consider how evaluations of the exchange explain outcomes.

3.3 The unfolding psychological contract and behaviour

Contemporary research uses the psychological contract both to understand the nature of the employment relationship (e.g. Rousseau, 1990) and to explain the link between the employment relationship and employees' attitudes and behaviours (for example, Parks & Kidder, 1994; Morrison & Robinson, 1997).

Considering the first aim of this thesis is to test psychological contract theory's ability to explain the behaviour of individuals working in a safety-critical context, this section focuses on the latter use and examines how the psychological contract unfolds and how this process explains employees' behaviours.

Principally, the literature can be divided into three approaches. The first approach considers the contents of the psychological contract and how, through the process of social exchange, the nature and range of obligations change with time, inducing employees to alter their reciprocal beliefs and thus their behaviour. The second approach considers the relative balance of the exchange in terms of both employer and employee expectations of its content and how this affects employees' reciprocal actions. The third approach focuses not on the contents, but on how employees evaluate the exchange; i.e. what is delivered and the extent to which the employer is perceived to be fulfilling its obligations. Although this thesis adopts the last approach, this section will briefly consider the other two approaches and their limitations as safety researchers have previously invoked social exchange to explain safety behaviour.

The next section explains the limitations of social exchange and balancing accounts, which may help to explain some of the equivocal findings discussed in Chapter 2. The section then goes on to discuss how employee evaluations of the exchange have been used to account for behaviour.

3.3.1 Contents and behavioural outcomes

Early studies were instrumental in defining the content of psychological contracts and the nature of exchanges (Conway & Briner, 2009); for example, Schein interprets Levinson et al., as follows:

The organization does certain things to and for the employee and refrains from doing other things. It pays him, gives him status and job security, and does not ask him to do things too far removed his job description. In exchange, the employee reciprocates by working hard, doing a good job, and refraining from criticising the company in public or otherwise hurting its image. The organization expects the employee to obey its authority; the employee expects the organization to be fair and just in dealing with him (1965, p. 61).

Psychological contract contents in this example contain inducements by the organisation such as pay, status, job security, and fair dealing, which the employee reciprocates with hard work, conscientiousness, loyalty, and obedience.

The relationship of different psychological contract contents with attitudes and behaviours has received limited empirical attention (Conway & Briner, 2009) despite the need to understand what motivates individuals to contribute to the employment relationship in productive and satisfactory ways (Herriot, Manning, & Kidd, 1997). There are several ways in which psychological contract contents are theorised to relate to outcomes. However, this section will review those that have had most attention; first a social exchange perspective and second through balancing of employer and employee expectations.

Social Exchange

Reciprocity is at the core of social exchange relationships (Gouldner, 1960) wherein unspecified obligations to reciprocate arise on the receipt of some benefit or favour from one's exchange partner (Blau, 1964). In safety contexts, social exchange has been used to explain the discretionary safety behaviour of employees; for example, Mearns and Reader (2008) asserted that perceiving that one's organization cares and values its employees induces employees to reciprocate with safety citizenship behaviour; Clarke (2013) maintained that transformational leaders influence their followers' safety behaviour through social exchange; and, Christian et al., (2009, p. 1106) proposed that social exchange explains employees' "motivational desire" to engage in voluntary safety behaviour in return for management commitment (i.e. safety climate).

The psychological contract is held to be one such social exchange relationship where inducements or benefits bestowed by the employer lead to the development of beliefs regarding future contributions or obligations owed by the employee thereby binding an employee to their employer in a "reciprocal exchange agreement" (Rousseau, 1989, p. 123). The longer a relationship endures, the wider the array of reciprocal obligations and thus the greater the contribution from the employee one might expect in terms of attitudes and behaviours. Parks and Kidder (1994) suggest, "A steady stream of research ... would support the contention that contracts with longer time frames (e.g. tenure), higher quality social and exchange relationships ... and higher commitment levels, are more likely to produce pro-role behaviours" (p.117).

However, and despite the popularity of social exchange in safety studies, in the psychological contract literature the support for social exchange as an explanation for employee attitudes and behaviours is both sparse and mixed (Conway & Briner 2009). Rousseau (1990) found

contingent relationships between employee and employer obligations as perceived by the employee for some but not all terms in the psychological contract. Coyle-Shapiro and Kessler (2002) found in a longitudinal study that perceived employer obligations at time 1 (what employees believe their employer is obligated to provide) were not related to employee obligations at time 2 (what employees believed they were obligated to do), suggesting that mechanisms other than reciprocity are responsible for employees' beliefs in reciprocal obligations. However, an employer's fulfilment of its obligations at time 1 was related to an employee's belief in his or her obligations at time 2, indicating that evaluations of the exchange may be more important than the content.

In another study, Hui, Lee, and Rousseau (2004) failed to find support for their argument that an "arm's length" or transactional approach to the employment relationship would be reciprocated with less organizational citizenship behaviour than an open-ended relationship. Indeed, the reverse was found to be true for a Chinese sample; no direct relationship between relational or balanced psychological contracts and citizenship behaviour was found. Rather it appeared that citizenship was governed by employees' instrumental orientation. Hui et al explain the finding by suggesting that citizenship may be considered part of transactional obligations in China and thus not dependent on an open-ended relationship.

These studies appear to suggest there is no consistent pattern in the content of reciprocal obligations; the behaviour of employees appears contingent on the employer's fulfilment of its obligations not simply on the perception that reciprocal obligations exist.

Balance

An alternative approach to examining the relationship of content to outcomes is to consider the balance in the exchange between parties and its effect on attitudes and behaviours. Blau (1964) maintained that individuals are uncomfortable with indebtedness and thus will be motivated to maintain an imbalance in their relationship in their favour, making contributions to both repay their debt and to induce the other party to reciprocate in the future (Coyle-Shapiro & Kessler 2002). However, relationships are also unlikely to endure if there is a large deficit arising from one party's failure to discharge their obligations to the other. Similarly, if individuals are too hasty in their attempts to relieve their indebtedness, trust may be eroded. Thus, individuals will seek balance in their exchange relationships (Shore & Barksdale, 1998).

Shore and Barksdale (1998) proposed that employment relationships are characterised by both the level of balance – balanced versus unbalanced – as well as the level of obligations held by both parties – high versus low – creating a fourfold typology of employer-employee exchanges.

MBA students completed the survey and those whose social exchanges were characterised by high levels of mutual obligations had significantly lower turnover intentions than individuals in the other three social exchange groups. However, individuals in the three remaining groups were not significantly different from each other with respect to the outcomes measured, which runs counter to expectations; for example, one might have expected individuals in the category of low mutual obligations or the group with significant imbalance in favour of the employer to have significantly higher turnover intentions than the other two groups. In the safety literature, unreciprocated over commitment on the part of employees has been linked to adverse health and safety outcomes (Quinlan & Bohle, 2009) and thus imbalance may matter more for health outcomes than behavioural ones. This thesis considers the health consequences of psychological contracts.

Conclusions

As is demonstrated by the studies related above, social exchange explanations for employee attitudes and behaviours are inconclusive at best. Studies tend to rest on the assumption that there is a clear delineation between contributions and inducements and the character of the resource or benefit being exchanged, an assumption that may not always be justified (Coyle-Shapiro & Conway, 2005). Questions remain therefore as to how the content of psychological contracts influence behaviour; the fact that a psychological contract contains obligations of a particular type does necessarily imbue an obligation on an employee to provide a particular type of behaviour. Indeed, scholars have argued that obligations - behaviour relationships are so idiosyncratic that one should not expect any patterning at all (e.g. Conway & Briner, 2009). What appears to matter for individuals' intended behaviour is the extent to which employers are fulfilling their obligations, and is the subject of the next section.

3.3.2 Evaluations of the psychological contract

The previous section indicated that the content of a psychological contract demonstrates inconsistent and weak relationships with outcomes and thus has limited utility in explaining behaviour. Psychological contract evaluations on the other hand exhibit stronger relationships with outcomes, particularly psychological contract breach (Zhao et al., 2007). Indeed, breach is proving to be the most compelling, popular, and reliable idea for linking psychological contracts with employee behaviours (Conway & Briner, 2009, p. 30 paraphrased).

This section examines how psychological contract evaluations are purported to relate to outcomes. It considers the positive effects of fulfilment and the negative effects of breach drawing, where possible, on studies that operationalise fulfilment as fulfilment and breach as breach. Finally, it considers the evidence to support a differentiation of the two constructs.

Introduction

In the psychological contract literature, scholars argue it is an employee's beliefs about the state of their psychological contract; i.e. their evaluations, which influence their behaviour (Robinson & Morrison, 1995). Psychological contract evaluations occur when individuals appraise what contributions or inducements they receive relative to what their existing psychological contract suggests they are owed or were promised (Rousseau & Tijoriwala, 1998). As such, an individual's appraisal can lead to the perception that his or her psychological contract is, or is in the process of being, over fulfilled, fulfilled or under fulfilled (Turnley et al., 2003), with under fulfilment more commonly referred to as psychological contract breach, but also referred to as psychological contract violation, and over fulfilment technically a breach (Conway & Briner, 2002).

Given a psychological contract is an employee's belief in reciprocal obligations, then fulfilment is defined as "the employee's beliefs about the extent to which their organization has fulfilled its obligations to them" (Robinson & Morrison, 1995, p. 290) and breach as "the cognition that one's organization has failed to meet one or more obligations within one's psychological contract" (Morrison & Robinson, 1997, p. 230). Applying the norm of reciprocity (Gouldner, 1960), an individual who perceives they have received what they were owed will develop positive attitudes and reciprocate with commensurate helpful work-related behaviour, and where they perceive they have been denied what they were owed, they will develop negative attitudes and reciprocate by withholding effort or even with unhelpful behaviour (Hekman, Bigley, Steensma, & Hereford, 2009). Reciprocity is the corner stone of psychological contracts with employees responding to evaluations of their psychological contracts with upward and downward evaluations of their own obligations (Schalk & Roe, 2007; Shore & Tetrick, 1994), which upon reaching certain thresholds will trigger behavioural responses (Rigotti, 2009). In simple terms, through reciprocity, a perception of fulfilment will lead to positive outcomes and a perception of breach will lead to negative outcomes.

The review that follows attempts to describe the separate effects of fulfilment and breach on behaviour. However, the extant literature has made it difficult to establish whether there is a difference in outcomes because it has tended to blur the distinction between fulfilment and breach and treat them synonymously. It is argued here that while both types of evaluations rest on the belief in reciprocal obligations, the negative consequences of breach are unlikely to be equal and opposite in their effects in comparison to fulfilment. Therefore, and recognising that researchers are beginning to question the often-made methodological assumption that fulfilment and breach are two poles of a continuum (for examples, see Cassar & Briner, 2011;

Conway & Briner, 2005) and are examining the differential effects of the two (see Conway, Guest, & Trenberth, 2011), the latter part of the section discusses the limited evidence for the differential effects of fulfilment and breach on outcomes.

Psychological contract fulfilment

People are motivated to keep promises, asserts Rousseau (1995, p. 24) enumerating six reasons why people try to honour the commitments they make, including social pressure, the desire to avoid inflicting losses on another, and the value of incentives for remaining committed versus the temptations to renege. However, given the highly perceptual nature of promises, the promise sent may not be the promise received, or indeed a promise may not have even been sent yet is perceived to exist, the potential for misunderstandings is considerable (Rousseau, 1995). The possibility also exists, therefore, for promises to range in the extent to which they are perceived to have been kept, from completely honoured, only partly honoured, to not honoured at all according to the extent to which inducements delivered are in line with what was expected (Morrison & Robinson, 1997).

Historically, two lines of reasoning have been offered to account for the relationship of psychological contract fulfilment with outcomes: a linear approach and a non-linear approach (Lambert, Edwards, & Cable, 2003). The linear approach maintains that increasing amounts of inducements will translate into increasing levels of satisfaction even if the promised level of inducement is exceeded. The non-linear approach maintains that the greatest amount of satisfaction is achieved when delivered inducements equal promised inducements and levels of satisfaction decline when inducements either exceed or fall short of what was promised.

While the emphasis of much research into fulfilment has been on promises (Montes & Zweig, 2009), in many instances it confounds promised inducements with delivered inducements (Montes & Irving, 2008). Furthermore, researchers indicate that it is what the organisation delivers that matters more than what was promised (Montes & Zweig, 2009). In respect of delivered inducements, Lambert and colleagues (2003) posited that they vary to the extent to which they can satisfy material, psychological, and relational needs and thus will vary in the extent to which a sufficiency or an excess is related to feelings of job satisfaction. For all inducements they considered, Lambert et al report that higher levels of fulfilment relative to what was promised correlated positively with satisfaction. Those inducements deemed likely to benefit from excesses comprised pay, recognition and relationships. Higher levels of these inducements would be indicative of higher status and thus lead to increasing levels of satisfaction. Those inducements deemed to suffer as a result of excesses comprised variety, skill development and career training. Levels over and above what was promised would inhibit need

fulfilment; for example, excessive variety would inhibit the development of proficiency and thus task performance. Further, they illustrated how an expanded view can add to our understanding of the consequences of over-fulfilment, demonstrating that one can have too much of some good things, e.g. when delivered levels of career training exceeded promised levels, satisfaction declined.

Research into psychological contract fulfilment and behaviour is sparse (Conway & Coyle-Shapiro, 2012) and for the most part concentrates on relationships between employees' beliefs in reciprocal obligations and outcomes rather than their evaluations of the state of their psychological contract, leading critics to argue that fulfilment adds little to our understanding over social exchange accounts (Guest, 1998). Nevertheless, recent studies that have investigated behaviour suggest that fulfilment (whether operationalised as kept promises, provision of inducements or fulfilled obligations) is positively associated with in-role performance (Conway & Coyle-Shapiro, 2012), organisational citizenship behaviours (Uen, Chien, & Yen, 2009), innovative behaviour (Thompson & Heron, 2006), externally rated job performance (Sturges, Conway, Guest, & Liefoghe, 2005) and have demonstrated that fulfilment can be differentiated from other social exchange constructs, such as perceived organisational support (Tekleab & Chiaburu, 2011). Research is also demonstrating that fulfilment has important associations with employees' mental health (e.g. Parzefall & Hakanen, 2010) and potentially functions to ameliorate exhaustion in high demand work settings (e.g. Chambel & Castanheira, 2012).

Notwithstanding these findings, psychological contract fulfilment has received very little conceptual attention in comparison to psychological contract breach (Conway & Briner, 2005, 2009), although it is acknowledged that many breach studies may actually be investigating low fulfilment rather than breach. Conway, Guest and Trenberth (2011) offer two reasons for the lack of interest. First, most research assumes that breach and fulfilment are two poles on a continuum and thus increases in one amount to decreases in another; fulfilment is presupposed to be opposite in its effects to breach. Second, broken promises have a far greater impact on employees than fulfilled promises do because of the damage they inflict on the trust between the parties, damage that is not easily repaired (Rousseau, 1989). Consequently, breach has taken centre stage. However, these two reasons are contradictory: if breach is far greater in its effects on employee outcomes than fulfilment, it stands to reason that fulfilment cannot be simply opposite in its effects on employees. Put another way, increasing amounts of fulfilment will not produce the same level of positive outcomes as increasing amounts of breach will produce negative outcomes. Indeed, Conway and colleagues demonstrated in a longitudinal study that fulfilment does no more than maintain levels of well-being and job satisfaction,

whereas breach has a detrimental effect on both affect and attitudes. This thesis attempts to establish the differential effect of fulfilment on safety outcomes by deploying a measure of fulfilment as well as a measure of breach.

Psychological contract breach

Employment relationships are not static but dynamic and thus, inevitably, situations arise where one or other party to the exchange is under or over obligated (Robinson, Kraatz, & Rousseau, 1994). In many instances, this is a natural part of the social exchange process as not all obligations are discharged simultaneously and varying amounts of time will elapse between the debt being incurred and the debt being repaid, with shorter time frames for economic resources and longer time frames for socio-emotional resources (Blau, 1964). Nevertheless, there is a social norm to reciprocate (Gouldner, 1960), an obligation to repay the debt. Blau suggests parties do not always conform and deliberate renegeing is indicative of attempts to exert power over the other.

Rousseau suggests (1989) that the norm of reciprocity is necessary but not sufficient to explain the behaviour of individuals in employment relationships. The social norm that places on individuals the obligation to help those who help them, does not specify the form the reciprocated help must take. For psychological contracts Rousseau states, “consistency between what is promised (or understood) and what is received is an issue’ (1989, p. 126) indicating that psychological contracts contain obligations that are not merely wished for, but are owed; there is an *obligation of reciprocity* and the form that the reciprocation will take is made in a promise (p. 127). Research has subsequently demonstrated that broken promises have a greater effect on attitudes and behaviour than unmet expectations (Zhao et al., 2007) indicating that in employment relationships the level of psychological engagement in beliefs is far greater than in other social exchanges.

Where employment obligations are concerned, beliefs regarding inducements promised for the contributions made are enshrined in employees’ psychological contracts (Robinson et al., 1994). When employees do not receive what they believe they were promised there are consequences for the employment relationship (Rousseau, 1989). Robinson and colleagues argue, “The failure of one party to comply with its obligations to another can be expected to erode both the relationship and the affected party’s beliefs in the reciprocal obligations of the two parties” (1994; p. 140). The disruption of the reciprocal process in employment relationships has been described both as psychological contract breach and psychological contract violation and up until recently, the two terms were used interchangeably (Conway & Briner, 2005). Currently, the perception of a broken promise is defined as psychological contract breach and is

distinguished from the emotional reaction that is associated with it, defined as psychological contract violation (Conway & Briner, 2005; Morrison & Robinson, 1997). This thesis supports this distinction and investigates breach and violation as separate constructs.

The concept of breach has received considerable attention and converges in terms of intercorrelations and explanatory power with related concepts, such as justice, to explain employee attitudes and behaviours (Conway & Briner, 2005, 2009). Scholars have attached much faith to the concept and with good reason. Two recent meta-analyses suggest that the relationship with attitudes such as trust can be as strong as -0.79 (lower credibility interval; Bal, De Lange, Jansen, & Van Der Velde, 2008) and the relationship with behaviour, although more modest still in the order of -0.20 for in-role behaviour and -0.11 for organisational citizenship behaviour (Zhao et al., 2007).

Many studies purport to show that psychological contract breach leads to employees altering their behavioural contributions both positive (e.g. Conway et al., 2011; Conway, Kiefer, Hartley, & Briner, 2014) and negative (Bordia, Restuborg, & Tang, 2008; Jensen, Opland, & Ryan, 2010). In most cases, these studies equate low fulfilment with breach and examine linear relationships between breach and outcomes (Rigotti, 2009) and yet research demonstrates that not all employees leave their organisation in response to breach (Zhao et al., 2007) or indeed respond with withdrawal behaviour (Ingrams, 2007; Kiazad, Seibert, & Kraimer, 2014).

Rigotti (2009) speculated that breach relates to a variety of outcomes in a non-continuous manner. In other words, individuals have zones of acceptance (Rousseau, 1995) where minor discrepancies are tolerated (Schalk & Roe, 2007) and thus the relationship with outcomes is likely to be less strong at low levels of breach, but once this level has been surpassed, the relationship with outcomes is likely to show a step change. Rigotti employed segmented regression analyses on data from 643 employees and observed for all outcomes except organisational commitment that a “kick-in” of responses took place when a threshold was reached (2009; p. 458).

Although it appears on the face of it that individuals build up a head of steam before responding, Rigotti’s study was cross-sectional in nature. Therefore, it is not possible to conclude cause and effect, neither to understand how many breach events need to take place, nor over what time period before a response is triggered. Additionally, the relationship between breach and organisational commitment did not operate according to a threshold model and thus raises doubts as to the utility of this mechanism in predicting all outcomes. Indeed, Kiazad and colleagues (2014), one of the few groups of researchers who operationalised breach as broken promises, demonstrated that breach can lead to more innovation not less, a behaviour that

demands considerable investment of time and energy, thereby demonstrating that behaviour does not always operate on a tit-for-tat basis (Conway & Coyle-Shapiro, 2012) as psychological contract theory would suggest. Further, it is assumed that this process is conscious and thus the responses are intentional; an individual *decides* enough is enough. Yet, a series of studies that disentangled the components of psychological contracts into promises and delivered inducements demonstrated that promises matter little for behavioural intentions, and perceptions of psychological contract breach can exist in the absence of promises (Montes & Zweig, 2009) raising doubts about the utility of the breach concept as well as the cognitive evaluation mechanism said to underpin it.

On the one hand breach offers considerable explanation of behaviour in employment relationships, but on the other, the concept is not without its problems as identified above. These may be in part be due to its operationalisation as low fulfilment, which likely leads to the lack of clarity as to the manner in which its effects take place. As noted by Cassar and Briner (2011, p. 287), there is a need to measure both the effects of a fulfilled contract as well as a breached one, particularly in relation to feelings of violation. This research heeds this call and deploys a measure of both not only in respect of the affective consequences of fulfilment and breach, but also in terms of their cognitive consequences too.

Differential effect of fulfilment and breach on outcomes

Traditionally, researchers have assumed that a continuum exists from psychological contract fulfilment to breach with increasing discrepancies between what was promised to what was delivered moving the individual along the continuum (Lambert, Edwards, & Cable, 2003). In the past, researchers have also tended to ignore the fact that psychological contracts can be over fulfilled as well as under fulfilled (Turnley & Feldman, 1999); have failed to consider the absolute level of inducement as well as the relative level of inducement in their assessments of psychological contract breach (Lambert et al., 2003); and have failed to consider the importance of the promise or obligation to the individual (Lester & Kickul, 2001). Moreover, researchers have assumed that this discrepancy model has a linear relationship with outcomes: the extent of satisfaction or dissatisfaction with the employment relationship corresponding to the extent of fulfilment or breach of the psychological contract (Conway & Briner, 2005). More recently, this linear relationship has been questioned with research demonstrating that broken promises have a stronger effect on affect than exceeded promises (Conway & Briner, 2002) and excesses of an inducement can actually have negative instead of positive consequences for attitudes; for example, Lambert et. al., (2003) demonstrated that excessive task variety can reduce job

satisfaction. Yet as long ago as the 1960s, Blau described the differential effect of the receipt and loss of rewards:

Regular rewards make recipients dependent on the suppliers and subject to his power, since they engender expectations that make their discontinuation a punishment...The threat of being fired is a negative sanction that gives an employer power over his employees, enabling him to enforce their compliance with his directives. Regular rewards create expectations that redefine the baseline in terms of which positive sanctions are distinguished from negative ones...Correspondingly, a man who has reason to expect to remain in his job does not think of his regular earnings as distinctive rewards, and the loss of his income is punishment for him. Only a raise in income is a specific reward, although even raises that occur regularly come to be expected, and in these cases a failure to receive a raise tends to be experienced as a punishment and may be so intended by the employer (Blau, 1964, p. 105).

However, in the contemporary psychological contract literature, fulfilment and breach are treated as interchangeable, equal and opposite in their effects on employees despite Rousseau's (1989) assertion that broken promises are not easily repaired. Studies have considered the discrepancies between promised and delivered inducements and their effects on behaviour; e.g. Vantilborgh et al., (2014). However, these adopt a difference score approach and do not ask the responder to indicate directly whether they consider their psychological contract to be fulfilled or broken. Rather it is the researcher who deduces the state of the psychological contract on account of the existence or lack of a discrepancy. Only two studies were found that test the differential effects of fulfilment and breach directly. First, Conway and Briner (2002) established in a novel diary study that broken promises had much stronger relationships with affect than exceeded promises did, and, Conway et al (2011) reported in a longitudinal study that fulfilment did no more than maintain well-being whereas breach eroded the same. No studies were found that test the differential effects of the unfolding psychological contract on behaviour.

Conway and Briner (2009) also report, for the most part, research focuses on substantive validity rather than construct validity in that it adopts a bivariate approach, seeking to understand the strength of the relationship between constructs and outcomes rather than using theory to explain the mechanisms by which they have their effects. This thesis addresses these failings in the extant literature, examines whether fulfilment and breach should be separated as well as offering and testing two theoretical mechanisms by which breach and fulfilment affect behaviour; namely affective events theory (Weiss & Cropanzano, 1996) and ego depletion theory (Baumeister et al., 1998)

3.3.3 Conclusion

The review above suggests that fulfilment and breach of psychological contracts might result in different reactions from employees, underpinned by different psychological processes. However, the question remains as to what these psychological processes are. The next section considers what these processes or mechanisms might be and seeks to address the question: how does fulfilment and breach of the psychological contract translate into behaviour?

3.4 Mediating mechanisms between fulfilment, breach and behaviour

This section, in line with the second aim of this thesis, explores the zone of acceptance that governs the exchange and discusses two pathways that might explain how psychological contract fulfilment and breach perceptions are converted into behaviour via: (1) a motivation mediation pathway and (2) an attention mediation pathway. The section discusses the evidence for these two different, but potentially related pathways and unfolds as follows; first, the relationship between psychological contracts and self-regulation is discussed before turning to examine the consequences of fulfilment and breach for the self-regulation of motivation; and, lastly, the consequences of fulfilment and breach for the self-regulation of attention.

3.4.1 Psychological contracts and self-regulation

In the psychological contract literature, much journal space has been devoted to researching moderators of the relationship between breach and outcomes (Conway & Briner, 2009), but rather less to exploring the mechanisms by which fulfilment or breach translates into behaviour, i.e. mediating mechanisms. Rucker and colleagues (Rucker, Preacher, Tormala, & Petty, 2011, p. 359) suggest that “mediation is typically the standard for testing theories of process” and Preacher and Hayes (2008, p. 879) explain that how or by what means a causal effect occurs is of greater scientific interest than identifying that two factors are causally related.

As identified by Turnley et al. (2003), the fulfilment and breach of the psychological contract is a process and different obligations can be in different stages of being met and unmet. The process is also dynamic and governed by tolerances regarding the level of discrepancy that individuals will or can endure (Schalk & Roe, 2007).

Scholars assert that psychological contracts serve to reduce uncertainty and increase predictability and control (e.g. Shore & Tetrick, 1994), which, as we have seen in a preceding chapter, is important in reducing job-related stress. Once a psychological contract has developed, Shore and Tetrick (1994) maintain it remains fairly stable and acts as a standard to

which individuals continually refer to guide action. They cite control theory (Carver & Scheier, 1985) to account for behaviour subsequent to the detection of a discrepancy. When a discrepancy is detected, referred to as violation, the extent of the discrepancy, the nature of the injustice the individual has experienced and attributions governing the organisation's level of responsibility are said to determine the behavioural response. However, Shore and Tetrick do not discuss how or why injustice perceptions lead to stress, or the undermining of predictability or control. Instead, they concentrate on the affective reactions, such as anger, which they posit is the fuel that connects injustice with behaviour.

Schalk and Roe (2007) concur with Shore and Tetrick, additionally proposing that there are two referent standards: (1) a limit of acceptance defining acceptable discrepancies; and, (2) a limit of tolerance defining unacceptable discrepancies. The first has upper and lower limits such that fluctuations in performance on obligations do not normally trigger responses until such times they cross these limits. When the psychological contract is in *balance*, behaviour runs automatically regulated by this "fixed" cognitive mechanism (Schalk & Roe, 2007, p. 173).

The second limit represents what might be referred to as the bottom line. Once crossed, the individual will either seek to revise their psychological contract, by altering their contributions, or desert it altogether. However, they argue that this process does *not* involve a "constant method of accounting" (p. 171) implied by Shore and Tetrick. Rather these evaluations only occur when triggered by events that do not fit with the mental model of the employment relationship (Rousseau, 1995). Schalk and Roe propose that it is only when the negative lower limit is exceeded does the relationship break down and episodes of aggression and depression occur.

The two accounts offer similar explanations for how the psychological contract regulates behaviour; namely control theory. However, Shore and Tetrick's account implies the employee is psychologically engaged in the process through constant monitoring, whereas Schalk and Roe's account implies that the employee is *not* psychologically involved and only when the breach is substantial enough to trigger relationship breakdown are intense emotional reactions exhibited. The next section explores the nature of these two processes further.

3.4.2 Psychological contracts and the self-regulation of motivation

Contemporary psychological contract theory (PCT) rests on the premise that psychological contracts are based on promises and reciprocal obligations that develop over time in long-standing relationships (McInnis, Meyer, & Feldman, 2009). However, theorists also recognise that this reciprocal process gives rise to affective experiences such as job satisfaction and affective commitment (e.g. Tekleab & Chiaburu, 2011) and when this reciprocation is disrupted,

it leads to a sense of violation (Morrison & Robinson, 1997) and feelings such as anger, resentment, and bitterness (Rousseau, 1989).

PCT has largely focussed on the affective experience as the outcome of the reciprocation process rather than on the consequences of affective experiences for behaviour. As noted earlier, modern day conceptualisations of organisational behaviour now emphasise the role of affect in employee actions with researchers suggesting that it is affect that acts as a motivational force; for example, Spector and Fox forward the view that “emotion is a functional mechanism whereby highly organized on-going activity is interrupted to force attention on urgent events that are relevant to physiological needs or that induce disturbing cognitive associations, such as threats to self-esteem” (2002, p. 273). Emotions engender motivation for action, which Spector and Fox go on to assert “... is likely to result in intentions to engage in certain behaviour at a subsequent time” (p. 273). Further Weiss and Cropanzano (1996) propose that affect can facilitate or interfere with work-appropriate behaviour. For example, helping one’s colleagues is influenced by how sociable people feel.

Primarily, the research focus has tended to be on negative emotions, reflecting findings from the emotion regulation literature (Grandey, 2000; Gross, 1998b), which reports that people are motivated to avoid bad moods and experience good ones with a positive-negative asymmetry evident in people’s mood regulation strategies (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001) such that people will exert greater effort to improve or avoid a bad mood (Gross, 1998a) than they will to create a positive mood. Where positive affective experiences are concerned, although their motivational force may be nuanced (Bindl, Parker, Totterdell, & Hagger-Johnson, 2012), studies indicate positive affect enables individuals to tackle more challenging and future-oriented goals and enact behaviours such as taking charge by increasing their self-regulatory resources (Bindl & Parker, 2010).

Thus, the affect-at-work literature suggests that affect acts as a motivational force, influencing how and where individuals channel their energies at work. This section evaluates the proposal that fulfilment and breach will have consequences for individuals’ motivational control through their experience of positive and negative affect.

Fulfilment and motivational control

Guerrero and Herrbach (2008) theorised that both the cognitive and the affective components of psychological contract fulfilment need to be studied in order to understand psychological contract fulfilment’s relationship with outcomes. For example, the “uplifting” feelings that the employee experiences need to be considered along with the employee’s perception that the

organisation values its contributions. Guerrero and Herrbach invoke Affective Events Theory (AET; Weiss & Cropanzano, 1996) to explain how this process works.

Weiss and Cropanzano theorised that events at work are often affectively laden; individuals react emotionally to the things that happen to them. Regardless of whether that emotional reaction is positive (joy, pride, love) or negative (anger, frustration, fear) the emotion *directly* influences the behaviour that results (p.13). Applying AET to psychological contracts therefore, the delivery or absence of an expected inducement is an event, which generates an emotional reaction. It is the affective reaction to the delivered inducement that drives behaviour immediately and in the longer term via work attitudes. Figure 3.1 illustrates the difference between traditional and AET proposals for the relationship between affect and performance.

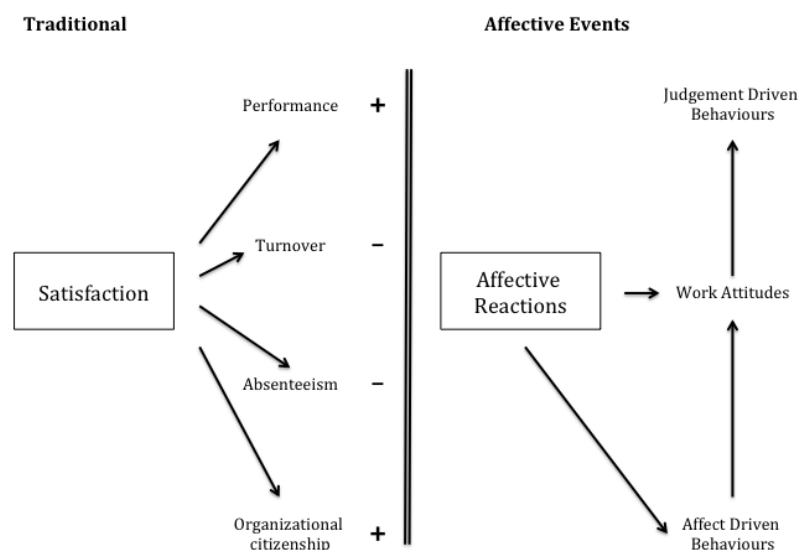


Figure 3.1. Traditional and affect-driven models of performance after Weiss and Cropanzano (1996)

Guerrero and Herrbach exemplified the process, demonstrating that psychological contract fulfilment led to positive perceptions of the employer relationship, which in turn led to positive affective experiences. In conclusion, they posit that phenomena such as mood will predict behaviours such as organisational citizenship far better than job satisfaction will, but do not actually examine this proposition.

A longitudinal study by Coyle-Shapiro and Conway (2005) supports Guerrero and Herrbach's reasoning and extends the analysis to relationships with performance. Coyle-Shapiro and

Conway demonstrated that it was the receipt of inducements that explained the effects of fulfilment on perceptions of organisational support, and this positive feeling towards the employer explained organizational citizenship behaviour. Consequently, Coyle-Shapiro and Conway conclude that social exchange is a better predictor of organisational citizenship behaviour than psychological contract theory. An AET explanation of the process suggests that psychological contract fulfilment induces positive affect towards the employer (e.g. POS), which influences motivational control and thus the willingness to engage in citizenship behaviour. This is the proposition tested in this thesis.

Breach and motivational control

Rousseau was the first to use the term psychological contract violation proposing that “Violating a psychological contract is failure of organizations or other parties to respond to an employee’s contribution in ways the individual believes they are obligated to do so” (Rousseau 1989, p.128). Rousseau’s definition captures a social-cognitive interpretation wherein psychological contract violation is a perception that one’s organization has broken its promise, a perception that is accompanied by feelings such as anger, resentment, and bitterness.

Drawing on Oatley’s (1992) research into the psychology of emotions, Morrison and Robinson (1997) differentiate between the cognitive perception of, and the affective reaction to, broken promises terming the former psychological contract breach and the latter psychological contract violation. Morrison and Robertson (1997) ventured that once a breach has been detected, attributions of deliberateness and appraisals of fairness moderate the feelings of violation that ensue. A test of their model indicated that only when the breach was perceived as unfair did causal attributions correlate significantly with feelings of violation (Robinson & Morrison, 2000). However, Robinson and Morrison were not able to establish whether the perception of fairness preceded or followed the causal attributions and feelings of violation as all outcomes were measured at time 2. Therefore, the possibility exists that feelings predate and even determine cognitions as Wundt (1907) and Zajonc (1980) posited. Zajonc (1998, p. 597) goes as far as to say “unless they first elicit an emotion cognitions of themselves are incapable of triggering instrumental processes” (cited in Dulac et al., 2008, p. 1085). Johnson and O’Leary-Kelly (2003) reasoned that because psychological contract breaches are person-specific, they present an identity threat to the individual and it is this threat that is associated with the strong emotional reaction that puts the individual in a state of action-readiness. Their ego involvement garners their response (Gendolla & Richter, 2010).

Very few studies have examined the affective mediating mechanisms between breach and outcomes (Conway & Briner, 2009; Dulac et al., 2008); for example, Zhao et al.’s meta-analysis

contained just 11 studies of violation and its consequences. Yet, theoretical conceptualisations of breach stress the emotional consequences of broken promises (e.g. Rousseau, 1989). Dulac et al. demonstrated that violation had far stronger relationships with affective commitment (-.31), trust in the organisation (-.68) and turnover intentions than psychological contract breach and conclude, “the emotional response to psychological contract breach (i.e. violation) may play a critical role in accounting for employee attitudes following breach” (2008, p. 1092).

Instead of examining mediating mechanisms between breach and behaviour, the majority of studies examine factors that moderate violation and without much recourse to theory (Conway & Briner, 2009). In many instances, Conway and Briner report these moderators are intuitive and add little to our understanding of the consequences of breach; for example, reactions to important promises are greater than to unimportant ones. In other instances they recount (2009; p. 37), the findings are contradictory and a moderator e.g. LMX, which inflames reactions in one study (Restubog et al., 2010), dampens them in another (Dulac et al., 2008). This, Conway and Briner conclude, is evidence of weak theory.

This thesis investigates the proposition that it is the affect that ensues from perceptions of breach that acts as the motivational force for safety behaviour.

Summary

In summary, it is posited that individuals are agents in their own experience and behaviour, and it is emotion that is the energising force behind intentional behaviour, emotions that arise as a consequence of fulfilment or breach being experienced. When organisations demonstrate care and concern, individuals are happy; when they fail to deliver promised inducements, individuals are angered. When individuals attribute these feelings to the actions of their organisations that either enhance or threaten their self-esteem, intentional, affect-driven behaviour seems likely. Thus behaviour may be a function of motivational control. This thesis tests this proposition directly.

3.4.3 Psychological contracts and the self-regulation of attention

As discussed earlier, not all agree that psychological contracts are founded on rational cognitive considerations (cf. Levinson et al., 1962). For these scholars, psychological contracts serve to satisfy unconscious needs, which if thwarted lead to emotional reactions that cause individuals to enact coping mechanisms. A more recent resource-based perspective supports this theorising and suggests that individuals “strive to obtain, retain, protect and foster those things they value” (Hobfoll, 2001, p. 341), i.e. resources, and when these resources are threatened they experience stress. Hockey (1993) contends that under conditions of stress, automatic,

unconscious physiological and psychological processes divert attentional and energetic resources away from more discretionary behaviours towards more on-task behaviours. In terms of positive experiences, Fredrickson (2001) offers in her broaden-and-build theory that individuals who feel joy after experiencing a positive event are able to expand their range of behaviours into more creative and playful activity. The positive emotions that people experience build their intellectual and psychological resources, which in turn broaden their thought-action repertoires.

This thesis argues that it is these unconscious psychological processes that are responsible for the effects of fulfilment breach on behaviour; for example, experimental studies have demonstrated that the processes of dealing with stress and managing negative emotions deplete individuals' finite attentional resources such that once exhausted individuals can no longer exercise attentional self-control and engage in appropriate standards of behaviour (cf. Baumeister, 2001). Conversely, when individuals receive rewards, the effects of tiredness can be erased (Baumeister & Vohs, 2007).

Implied in both accounts is the idea that joy or stress induced by experiencing a positive or negative event alters the allocation of attention, which in turn affects the type of behaviour individuals engage in. Accordingly, this section evaluates the proposition that fulfilment and breach have consequences for individuals' attentional resources, which in turn govern their behaviour; the zone of tolerance governing behaviour is potentially a zone of capacity not acceptance.

Fulfilment and attentional control

Interestingly, despite the suggestion that psychological contracts act to buffer against stress (Shore and Tetrick, 1994) and are concerned with the exchange of resources (Bakker, Demerouti, & Verbeke, 2004) it is only recently that researchers have made reference to resource theories, such as Hobfoll's conservation of resources theory (COR; Hobfoll, 1989), to account for a buffering effect of psychological contract fulfilment on individuals' behaviour (e.g. Bal, De Cooman, & Mol, 2011; Brown & Roloff, 2011; Kiazad et al., 2014; Parzefall & Hakanen, 2010; Rayton & Yalabik, 2014). Brown and Roloff (2011) posit that psychological contract fulfilment functions to modify the relationship between the effort to obtain resources and psychological depletion in two ways (1) it serves as a resource gain, and (2) it replaces lost resources. Two studies demonstrate how this works in practice.

First, Parzefall and Hakanen (2010) illustrated how psychological contract fulfilment can be beneficial to employee well-being, leading to increased vigour and dedication that reduces

mental strain. They demonstrated that individuals whose psychological contracts are more fulfilled are more engaged in their work and feel less tired, overstretched and nervous.

When it comes to fulfilment's role in resource replenishment, Brown and Roloff (2011) showed that teachers who are professionally committed and invest time in duties additional to their job requirements can suffer burnout. For individuals whose employers fulfilled promises of financial and administrative support, the relationship between extra-role time and burnout was non-significant. When unscrupulous employers failed to honour these promises that help individuals to either meet these extra-role requirements or recover from their depleting effects, this unreciprocated commitment led to negative health consequences. Thus psychological contract fulfilment is both a resource in its own right and a resource gain after a resource investment; it both bolsters individuals enabling them to take on extra roles as well as replenishing the energy expenditure.

However, both studies are cross-sectional in nature so it is not possible to make definitive conclusions regarding the direction of causality; fulfilment may precede behaviour or behaviour may precede fulfilment. Furthermore, both studies deploy fulfilment as a moderator of the relationships rather than as a mediator and thus knowing that fulfilment equates to a resource gain does not answer the question of how this impacts behaviour.

Breach and attentional control

Many studies have shown that psychological contract breach leads to employees decreasing their positive (e.g. Conway et al., 2011; Conway, Kiefer, Hartley, & Briner, 2014) and increasing their negative (e.g. Bordia et al., 2008; Jensen et al., 2010) behavioural contributions. However, there are very few studies that look at the reasons why individuals change their contributions and where studies do, they focus on their motivation as opposed to their capacity to perform.

As with fulfilment, studies of breach are applying COR to understand the influence of the stress response that follows from psychological contract breach (e.g. Chambel & Oliveira-Cruz, 2010; Gakovic & Tetrick, 2003). Scholars are also considering how negative affect interferes with the content and the process of thinking (Forgas & George, 2001), proposing that individuals both selectively recall information and engage in effortful cognitive evaluations in response to breach in an attempt to feel better (e.g. Zhao et al., 2007).

As with fulfilment, the number of studies is limited, and none have examined the attentional consequences of breach directly, deploying measures of work engagement or job satisfaction instead. Nevertheless, two studies do illustrate how the stress effects of breach lead to reduced psychological resources and behavioural changes. Chambel and Oliveira-Cruz (2010)

investigated the effects of breach on soldiers' engagement and burnout and found that over time individuals felt more "used up" by their work and felt less vigour and dedication. Whereas during the mission, breach and burnout were related, breach only predicted levels of engagement at the end of the mission. The authors conclude that the stress the soldiers experienced at the time they were on deployment ceased when the mission ended because the unpredictability and lack of control brought about by breach also ceased. More general evaluations explained the lack of engagement at the end of the soldiers' tour of duty. This study lends support to the idea that there may be two self-regulatory processes in operation; one that affects the attentional resources that individuals have when they are stressed, and the other that affects their motivational resources when they evaluate their employer more generally.

Kiazad and colleagues (2014) deployed COR and demonstrated that breach can lead to more innovation not less, a behaviour that demands considerable investment of time and energy, thereby demonstrating again that behaviour does not always operate on a tit-for-tat basis (Conway & Coyle-Shapiro, 2012). Rayton and Yalabik (2014) proposed that when individuals lose resources they may engage in extra efforts, not less, in order to reinstate their previous standing. However, Kiazad et al.'s findings only related to already well-resourced individuals.

The alternative explanation for these results is that it is not the psychological contract that regulates behaviour, but the individual's own capacities. Psychological contract events signal whether or not resources that individuals need are going to be forthcoming and it is these events that determine the response. The subsequent behavioural withdrawal is unintentional and a consequence of a loss of self-regulatory capacity (Baumeister, 2001) rather than as a consequence of intentional withdrawal as a result of unfavourable comparisons with the psychological contract stored in memory. Where individuals do not exhibit withdrawal but expansive behaviours in response to breach, as with Kiazad et al's study, ego depletion theory (Baumeister, 2001) explains that it is only individuals who are already taxed that will suffer deterioration in performance. Those whose cognitive capacity is replete will still have the attentional capacity to deal with the breach as well as focus their attention on acquiring new resources. This study examines this proposal and considers the extent to which attentional resources wax and wane with the unfolding psychological contract.

3.5 Conclusions

The psychological contract is one of the most popular constructs for studying the employment relationship because it "captures the spirit of the times" and the individualisation of employee agreements with employers (Guest, 1998, p. 19). It is conceived of as a social exchange

construct, wherein the promise of some benefit from his or her employer induces the employee to reciprocate. However, social exchange is lacking and a belief in reciprocal obligations does not adequately explain behavioural outcomes. Conversely, researchers have demonstrated that the receipt or absence of an inducement matters more to individuals (Lambert et al., 2003) than the promises that are made. Therefore, this thesis examines the consequences when employees evaluate the exchange and deduce that their employer has succeeded or failed to deliver on its obligations.

Evaluations of the psychological contract have been the subject of much research in the contemporary psychological contract literature with the primary focus on breach. Indeed, breach has been heralded as the most promising aspect of psychological contract theory when it comes to explaining outcomes (Conway & Briner, 2009). However, and despite the suggestion that breach is very damaging to the employment relationship and is not easily repaired (Rousseau, 1989), fulfilment and breach have been treated as two poles on a continuum with breach conceptualised as the opposite of fulfilment (Conway & Briner, 2005). Very recently, researchers have questioned this methodological assumption and demonstrated that fulfilment is far weaker in its positive effects than breach is in its negative effects (Conway et al., 2011) and thus this thesis seeks to establish whether or not the two should be separated to understand how the unfolding psychological contract affects employee safety behaviours.

Following the successful distinction of breach from its emotional consequences, termed violation, (Morrison & Robinson, 1997), scholars are now calling for a differentiation of fulfilment into its cognitive and affective components (e.g. Guerrero & Herrbach, 2008). Yet, research into psychological contract fulfilment is still sparse (Conway & Coyle-Shapiro, 2012) and thus its relationship with outcomes is poorly understood. While there has been a wealth of research into psychological contract breach, a multitude of mediating and moderating mechanisms have been proffered (Conway & Briner, 2009) leading to a lack of clarity of understanding as to how breach translates into behaviour. For the most part, researchers propose that psychological contracts, the mental models stored in memory, regulate behaviour (Rousseau, 1995; Schalk & Roe, 2007). However, this does not square with the proposition that affect often precedes cognition and energises individuals to act, not vice versa (Zajonc, 1980). This thesis proposes and tests the idea that affect acts as a mediator between perceptions of fulfilment and breach and outcomes and thus provides the motivational force for safety behaviour, a so-called "motivation pathway".

The earlier conceptualisations of the psychological contract emphasised the unconscious and implicit needs as the driving force of behaviour (e.g. Levinson et al., 1962; Meckler et al., 2003).

However, few contemporary researchers have considered the consequences of fulfilment and breach for unconscious attentional processes and how dealing with negative emotions contracts individuals' attentional resources and how positive experiences broaden them. Even though studies are beginning to draw on Hobfoll's (1989, 2001) conservation of resources theory, they do not deploy measures that capture attentional functioning, or examine the unintentional behavioural consequences of fulfilment and breach perceptions. This thesis rectifies this omission and deploys a measure of cognitive functioning to capture the unconscious processes intervening between perceptions and behaviour, a so called "attention pathway".

In summary, there is an urgent need to understand how and when fulfilment and breach affect outcomes, particularly behavioural, in order to inform employers about the inducements that enable individuals to act for the benefit of themselves and their organisation. The next chapter describes the research framework in which motivation and attention regulation mechanisms are hypothesised to explain the relationship of fulfilment and breach with well-being, safety compliance, safety citizenship, unsafe and unhealthy behaviours.

Chapter 4. Research framework

This chapter sets out how this thesis will address the issues identified in the literature review. The chapter also presents the research questions that guide the thesis and the theoretical model the empirical studies are designed to test. The chapter concludes with an introduction to the empirical studies.

4.1 Issues to be addressed by this research

This section summarises the issues identified in the literature and presents the research framework that guides the rest of the thesis in addressing these issues.

The first aim of the thesis is to explain the on-going variation of safety behaviour using psychological contract theory. Three aspects of safety behaviour are examined so that the sum total of an individual's contribution to the safety performance of their organisation can be investigated, namely safety compliance, safety citizenship and unsafe behaviour. Psychological contract theory is offered as a promising vehicle to explain these safety behaviours and their preservation and withdrawal through the concepts of fulfilment and breach.

Relatedly, the second aim of the thesis is to test psychological contract theory as a theory of workplace behaviour, specifically examining whether motivation or attention defines the limits or tolerances that regulate behaviour in response to fulfilment and breach of the psychological contract and reflecting on the ascendancy of cognition implicit in contemporary psychological contract thinking.

4.2 Research questions

The research questions (RQs) set out below relate to the aims of this thesis and are designed to test the propositions presented below. RQ 1 relates to the first aim, which is to use psychological contract theory to explain the on-going variation in in-role, extra-role and anti-role safety behaviour of individuals engaged in safety-critical work. RQs 2, 3 and 4 address the second aim and set about testing psychological contract theory's ability to account for workplace behaviour through its concepts of fulfilment and breach. These questions also examine the proposed dual-pathway model offered to account for how the psychological contract regulates behaviour. Figure 4.1 presents a model of the latent constructs and how they relate to one another along with the RQs that test these relationships.

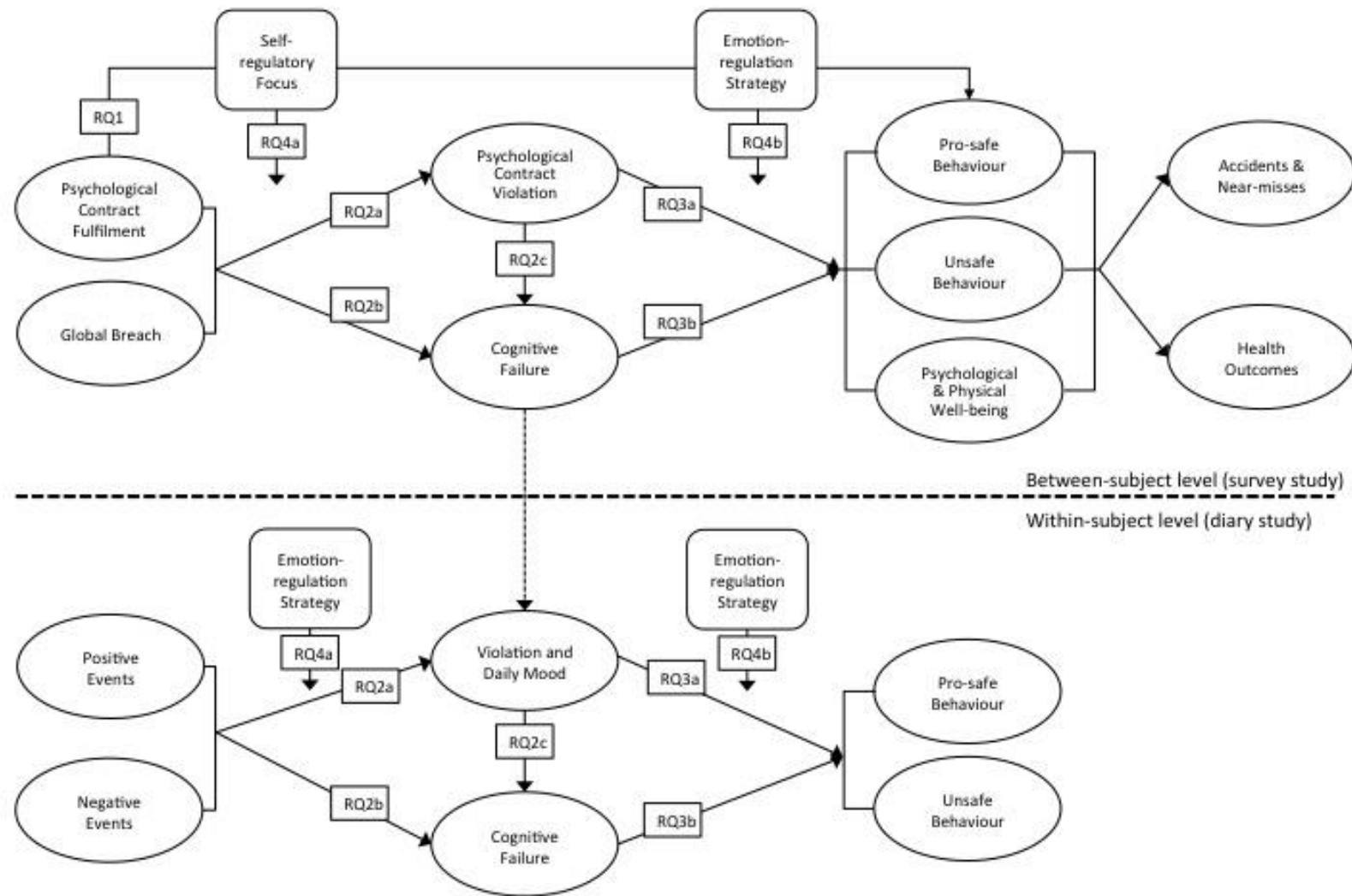


Figure 4.1 Path model depicting latent constructs and research questions.
Note. Motivation pathway is via psychological contract violation and Attention pathway is via cognitive failure.

The model also acts as a framework to guide the analysis in the subsequent empirical studies discussed in chapters 5 and 6, although it is important to note that for statistical reasons the analysis may not proceed in the same order as the questions. Accordingly, this section presents the RQs along with an explanation of how they relate to the aims of the thesis.

RQ1. What is the relationship of fulfilment and breach with individuals' health and safety behaviour?

In order to establish whether psychological contract theory can be used to explain safety behaviour and outcomes, it is first necessary to establish whether the psychological contract matters to employees engaged in work that is hazardous, subjects them to competing demands and constrains their options for behavioural expression. If an organisation's performance on its obligations is irrelevant to employees' safety behaviour, then we would expect to see individual safety behaviour varying, but not in synchrony with their organisation's fulfilment or breach of its obligations. The hypothesised model will be tested using Structural Equation Modelling (SEM); a poor fit of the model to the data will call into question the validity of the propositions. Assuming that it does matter, the second task is to identify the structure of the relationships and establish whether the path from breach and fulfilment to health and safety behaviours is direct, partially mediated or fully mediated. Again, SEM will be used to test the adequacy of fit of the hypothesised structural model to the data.

RQ2a. What is the relationship of fulfilment and breach with violation?

RQ2b. What is the relationship of fulfilment and breach with cognitive failure?

RQ2c. What is the relationship between violation and cognitive failure?

This second question pertains to the level of psychological engagement and level of conscious awareness individuals have with their psychological contract. There are two competing explanations. The clinical school (Meckler et al., 2003) maintains that individuals are very emotionally engaged with their psychological contract although they may not be consciously aware of the fact; individuals *need* their organisation to fulfil its obligations. The cognitive school (Rousseau, 2003) maintains that individuals are not very emotionally engaged until such times a discrepancy is detected. However, they are consciously aware of what they expect from their employer; individuals believe their organisation *promised* to fulfil its obligations. RQ2 attempts to establish which school has greatest support overall by assessing the strength of the relationship with violation and cognitive failure. Violation is deployed to capture the

motivational force for behaviour in response to fulfilment and breach of *promised* obligations. Cognitive failure is used to capture the attentional consequences of dealing with the emotions experienced when one realises that one's *needs* are, or are not going to be satisfied.

Recognising that if time elapses between experiencing the event and reporting one's reactions, the data might reveal individuals' most salient and not their typical experiences, the model is assessed once again at the within-person level. A daily diary study is used to capture the impact of fulfilment and breach events on violation and cognitive failure as and when they occur.

RQ3a. To what extent does violation mediate the relationship of fulfilment and breach with outcomes?

RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with outcomes?

This research question considers the theoretical mechanisms by which fulfilment and breach have their effects on behaviour and outcomes and thus relates to both the first and second aims of this thesis.

There is confusion in the literature about how the psychological contract regulates behaviour with both cognitive (beliefs in reciprocal obligations) and affective (violation) mechanisms being proposed. Psychological contract theoreticians conjecture that a fixed cognitive schema representing the standards expected of both the organisation and the individual regulates behaviour (Rousseau, 1995). A cognitive feedback mechanism (Carver & Scheier, 1990) triggers affect and behavioural changes ensue when limits of acceptability and tolerability are reached, the zone of acceptance denoting the upper limits and the zone of tolerance denoting the lower limits (Schalk & Roe, 2007; Shore & Tetrick, 1994). However, Carver and Scheier's model is concerned with individuals' pursuit of complex and long-term personal and social goals and thus the cognitive feedback mechanism on which it depends is considered too slow to account for individuals' immediate behavioural choices (Hockey, 1993) such as those of interest in this thesis.

Affective events (Weiss & Cropanzano, 1996) and ego depletion (Baumeister, 2001; Baumeister et al., 1998) theories are offered as alternatives to Carver and Scheier's model to account for on-going dynamic variation in individual safety behaviour. The former asserts that workplace events generate affect, which motivates people to act; happy employees will be motivated to perform productive behaviours whereas angry employees will not, and may even be motivated

to engage in counterproductive behaviours; i.e. a motivational control mechanism regulates individuals' behaviour in response to fulfilment and breach events.

The latter theory asserts that individuals' self-control strength is a limited resource, which is depleted by having to deal with aversive emotions and replenished by positive emotions; depleted individuals do not have the capacity to persist at behaviours they should perform nor desist from behaviours they should not perform; i.e. an attentional control mechanism regulates individuals' behaviour in response to fulfilment and breach events.

Thus, this research question investigates the dual determinants of behaviour; namely, motivation and attention. It seeks to establish the extent to which the zone of tolerance that regulates behaviour is based on an attention control mechanism such as ego depletion theory would suggest, and, the extent to which it is based on a motivation control mechanism as affective events theory would suggest. Further, this question examines how we account for dynamic variation in individual behaviour, to what, do individuals engage in safety behaviours as a function of how they are feeling or as a function of how depleted their self-control strength is?

RQ4a. To what extent does self-regulatory focus moderate the relationship of breach with violation and cognitive failure?

RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with behaviour?

This final research question concerns the first aim of the thesis and investigates the individual differences that can moderate the impact of psychological fulfilment and breach on psychological and behavioural outcomes.

Individuals differ in respect of their goal focus and the strategies they use to control their expression of negative emotions. These habitual behaviours are known in lay terms as professionalism (Personal communication, 2011) and in psychological terms as self-regulatory focus (Wallace & Chen, 2006) and emotional regulation strategy (Diefendorff, Richard, & Yang, 2008).

Individuals' self-regulatory focus is either habitually oriented to production goals wherein individuals will expend their energies fulfilling their desires to obtain rewards (Kanfer & Heggstad, 1999). Alternatively, their self-regulatory focus is habitually oriented towards preventing performance problems and thus their energies are devoted to making sure they are

diligent in their work (Wallace & Chen, 2006). It is proposed that these individual differences in self-regulatory focus are more proximal to the safety behaviour of individuals than other personality factors, such as extraversion and neuroticism, and thus are likely to interact with psychological contract fulfilment and breach to influence the extent to which violation or cognitive failure is implicated in subsequent behaviour.

Individuals also differ in the extent to which they deploy emotion-regulation strategies and are able to “keep their cool” (Richards & Gross, 2000) when faced with adversity. Two broad categories of strategy exist: antecedent-focussed and response-focussed emotion-regulation. When individuals employ the first strategy, they reappraise how they perceive the negative event and thus dampen the negative feelings they experience. When individuals use the second class of strategy, they suppress the emotional response and try and alter the emotions they display. Such suppression comes at a price and consumes self-control strength. Alternatively, they continue to think about the event and thus maintain levels of arousal. This rumination (Gross & Thompson, 2007) quickly exhausts self-control strength (Bushman, 2002; Genet & Siemer, 2012). An individual’s choice of strategy is therefore likely to interact to moderate both the motivation mediation pathway to make intentional withdrawal more or less likely and the attention mediation pathway to make self-control failure more or less likely.

4.3 Link between research questions and empirical studies

The research questions presented above are examined via two empirical studies. Table 4.1 displays how the empirical studies are linked to the research questions.

The first study, reported in Chapter 5, is a longitudinal survey. Two waves of data collection occurred over six months enabling cross-sectional and longitudinal analyses to be undertaken at the between-person level of analysis. The study examines whether psychological contract theory is relevant in a safety context by establishing whether fulfilment and breach have valid relationships with health- and safety-related behaviours (RQ1).

The main thrust of the thesis is to examine the mechanisms that explain how and why psychological contracts affect behaviour. Two mediating mechanisms are proposed and tested via the first study as well as the diary study (see below). The survey enables the hypothesised model, which includes a motivational and an attentional mediating pathway (as depicted in Figure 4.1), to be tested using the first data set and then cross-validated using the second data set. This represents a robust assessment of the theorised mediating mechanisms (RQ2 and RQ3) and enables us to establish whether, and to what extent, safety behaviours and well being

are a function of employees' affective or attentional experiences that arise when their psychological contracts are fulfilled or broken.

The diary study focuses on processes at the within-person level. It examines the links between changes in the state of the employment relationship, changes in affect and attention and the consequences for safety behaviour on a daily basis for a period of fourteen days.

Both the survey and the diary study examine the moderating effects of individual differences in emotion regulation to see whether people influence the impact of their own experiences on their behaviour through their goal focus and choice of emotion regulation strategy (RQs 4a and 4b).

Table 4.1
Research questions addressed by empirical studies.

Study chapter	Research question addressed	Analysis
Longitudinal survey (Chapter 5)	RQ1	SEM Model fit
	RQs 2a, 2b, 2c, 3a, 3b, 3c, 4a and 4b	SEM cross-sectional path analyses
	RQs 2a, 2b, 2c, 3a and 3b	SEM longitudinal path analyses using a change-score approach
Daily diary study (Chapter 6)	RQs 2a, 2b, 2c, 3a, 3b, 3c, 4a and 4b	Multi-level models

The two empirical study chapters present the theoretical underpinnings to this research and make predictions about the findings in relation to the research questions. Chapter 7 brings the results of these studies together and discusses the conclusions in respect of the research questions.

4.4 Summary

This chapter set out the research framework supporting the thesis. It outlined the issues to be addressed arising from the literature review and presented the research questions on which the thesis focuses. The chapter concludes with an explanation of how the empirical studies reported in Chapters 5 and 6 relate to the research questions.

The empirical studies now follow, starting with the longitudinal survey (Chapter 5) then the daily diary study (Chapter 6). Chapter 7 draws the studies together and establishes the answers to the research questions as well as commenting on how well the questions have been addressed and the aims of the thesis have been met. At the end of Chapter 7, a reflection on the theoretical and practical implications of the findings, comments on the limitations of the research and recommendations for future research directions bring the thesis to a close.

Chapter 5. A longitudinal survey of psychological contracts and safety behaviour

5.1 Introduction

This chapter reports the results of the first empirical study, a longitudinal survey designed to test the aims of this thesis at the between-persons level at two points over a six-month time period.

The survey aims to explore the relationship between breach and fulfilment of the psychological contract, safety behaviour (task, citizenship and unsafe) and outcomes (health and safety-related) both cross-sectionally and longitudinally. It seeks to establish whether the relationship between the psychological contract and behaviour is mediated by motivation or attention as well as establish whether the relationships hold for all safety behaviours or for only some. The study also explores the relationship between constructs over time to see if changes in the psychological contract associate with changes in behaviour, and, whether individual differences in self-regulatory focus and emotion-regulation strategy moderate relationships.

The study is guided by the following research questions.

- RQ1. What is the relationship of fulfilment and breach with individuals' health and safety behaviour?
- RQ2a. What is the relationship of fulfilment and breach with violation?
- RQ2b. What is the relationship of fulfilment and breach with cognitive failure?
- RQ2c. What is the relationship of violation and cognitive failure?
- RQ3a. To what extent does violation mediate the relationship of fulfilment and breach with outcomes?
- RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with outcomes?
- RQ4a. To what extent does self-regulatory focus moderate the relationship of breach with violation and cognitive failure?
- RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with behaviour?

5.2 Conceptual framework

This thesis proposes two mediating mechanisms by which fulfilment and breach explain safety behaviours: (1) a motivational pathway, and (2) an attentional pathway. First, the section briefly reviews the support for the two mediating mechanisms before considering a model depicting how these mechanisms might (a) relate to fulfilment and breach; (b) health and safety behaviours through the self-regulation of motivation and attention; and, (c) how individual differences in self-regulatory focus and emotion-regulation strategy moderate these relationships. The theoretical model is presented in Figure 5.1 along with the hypotheses.

5.2.1 Introduction to the theoretical framework

The central position in psychological contract theory is that individuals reciprocate behaviour in exchange for fulfilment of their psychological contracts and withdraw behaviour when their psychological contracts are breached. As discussed in Chapter 3, there is a hot debate between the cognitive and the clinical school regarding the process controlling how psychological contracts operate to govern behaviour. The cognitive school is in the ascendancy and its theoreticians propose that structures in memory regarding promissory obligations govern the standards of behaviour expected and reciprocated within some zone of tolerance and acceptance (Rousseau, 1995; Schalk & Roe, 2007; Shore & Tetrick, 1994). When limits are exceeded, individuals experience powerful feelings, known as violation, that motivate them to act (Robinson & Morrison, 2000).

The scholars of the earlier clinical school assert that an implicit agreement exists between employer and employee such that the individual will be afforded the opportunity to satisfy his or her unconscious needs for affection, aggression and dependency (Levinson et al., 1962; Meckler et al., 2003; Schein, 1965). When individuals' need fulfilment is frustrated, these scholars argue that individuals experience psychological distress, which in turn initiates coping and defence mechanisms designed to alleviate the anxiety they experience. More recent accounts refer to this coping process as sense making (Chaudhry, Wayne, & Schalk, 2009). When individuals engage in sense-making their attention is diverted to deal with the feelings they experience (Forgas & George, 2001) and away from their work tasks (Beal et al., 2005).

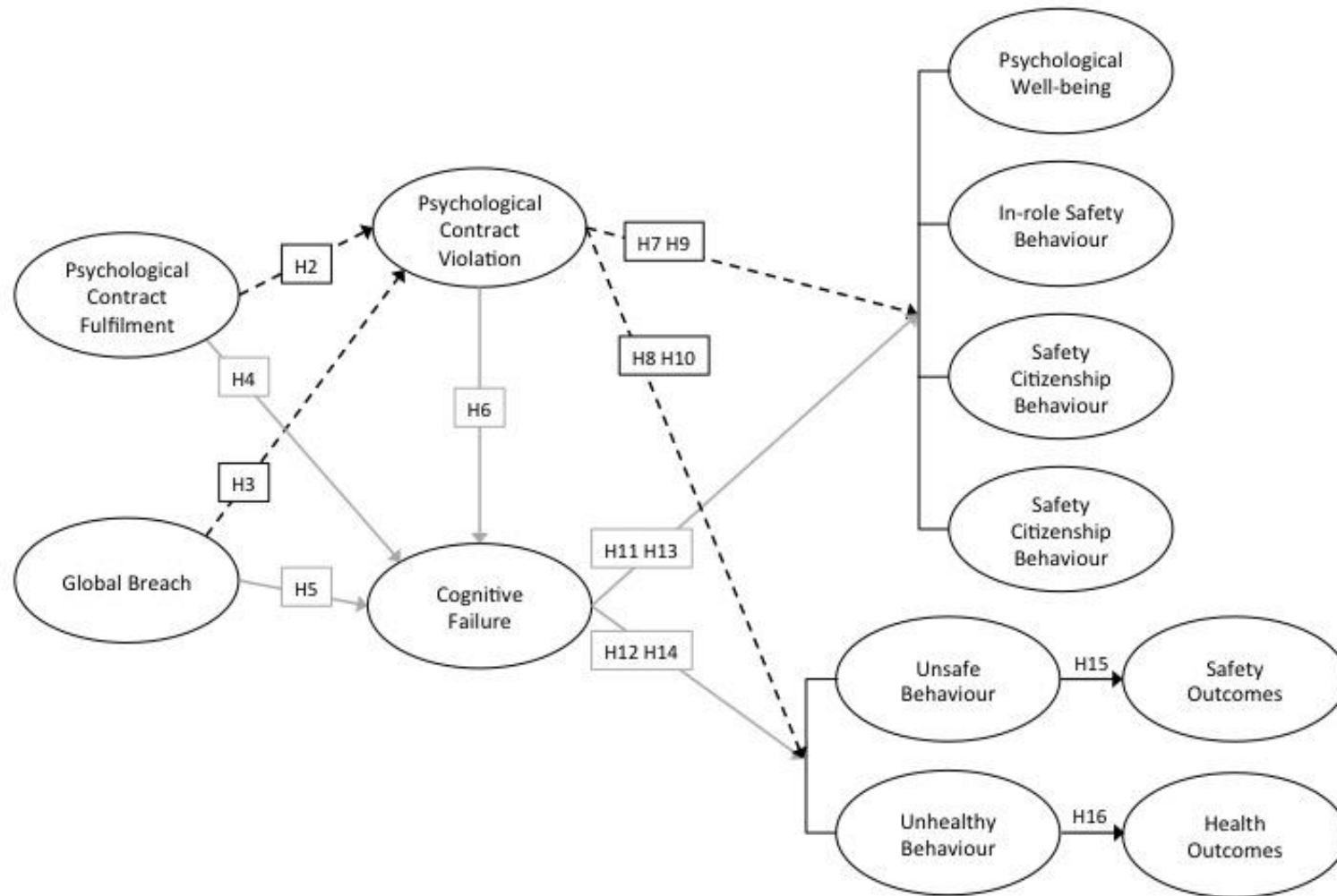


Figure 5.1 Theoretical model and hypotheses

Notes. Dashed line denotes motivation mediation pathway and grey line denotes attention mediation pathway

The proposition forwarded here is that the scholars above are describing two separate but interrelated mediating mechanisms that connect fulfilment and breach to safety behaviour; namely the self-regulation of motivation and the self-regulation of attention. The former controls the effort that individuals apply and the latter the capacity they have to devote their minds to their work.

Chapter 2 reviewed the research that provides support that these mechanisms operate in the safety domain. The chapter concluded that there is adequate evidence that these mechanisms are related to safety behaviour, but concluded that individual difference (e.g. Christian et al., 2009; Clarke & Robertson, 2005) and situational accounts (e.g. Clarke, 2012; Nahrgang et al., 2011) deployed to date, do not provide adequate explanations for findings where safety behaviour is concerned. This research tests the argument that safety behaviour can also be understood as a motivational and an attentional response to psychological contract events.

As discussed in Chapter 3, there is surprisingly little research that examines the mechanisms by which psychological contracts influence behaviour, albeit there is growing recognition of the importance of breach as a source of affective experiences at work (Morrison & Robinson, 1997). Psychological contract scholars are employing affective events theory (AET; Weiss & Cropanzano, 1996) and using violation to explain how breach has its effect on behaviour (e.g. H. Zhao et al., 2007). However, fulfilment, and the affect it might generate, has not received the same attention (for exceptions, see: Conway et al., 2011; Guerrero & Herrbach, 2008; Vantilborgh, 2015).

More recently, there is a trend in the extant literature indicating that scholars are now taking a resource perspective with frequent reference to Hobfoll's (1989, 2001), conservation of resources theory, promoting the argument that events, such as breach, threaten resource supplies and thereby generate stress (cf. Kiazad et al., 2014). With few exceptions (e.g. Chambel & Oliveira-Cruz, 2010), these studies are cross-sectional in design and fail to deploy measures that reflect the mediating mechanisms of stress being proposed (for exceptions see: Bordia, Restuborg, & Tang, 2008; Suazo, 2009). This study expands on this perspective and uniquely deploys ego depletion theory, which is operationalised as cognitive failure, to account for the withdrawal of safety behaviour.

In summary, the aims and related contributions of this study are twofold. The study's primary aim is to establish whether the psychological contract can be used to explain individual safety behaviour. The longitudinal design enables the direct and indirect influence of the psychological contract on safety behaviour to be examined predictively as well as cross-sectionally.

The second aim of the study is to test psychological contract theory; namely to establish how the zone of tolerance, which determines when and in what ways individuals respond to changes in their psychological contract, operates. The study examines whether a motivation model or an attention model best describes the relationship between constructs; i.e. do individuals intentionally modify their behaviour in response to changes in their employment relationship based on how they feel, or are any changes in behaviour unintentional consequences of changes in the allocation of attention and how much self-control strength they have. It examines which behaviours are susceptible to which mechanism.

5.2.2 Theory building and hypotheses

This section presents the theory and the hypotheses alongside the research questions that this study seeks to answer.

RQ1. What is the relationship of fulfilment and breach with individuals' health and safety behaviour?

The first research question is concerned with establishing whether a belief in reciprocal obligations and employees' evaluation of the exchange underpins the behaviour of employees working in a safety critical context. Little research exists that investigates the inter-relationships of fulfilment and breach and safety behaviours. That which does, suggests an employer's breach of its safety obligations relates indirectly to employees' safety compliance and participation through their breach of their own obligations (Walker, 2013).

Predominantly, psychological contract studies are carried out in contexts where employees can reciprocate in a manner of their choosing. Employees in a safety-critical environment threaten their own safety as well as those around them when they withdraw from their job responsibilities and thus face greater sanctions (Reason et al., 1998). Thus, it is reasonable to suppose that breach can have more severe consequences for individuals' psychological well-being as there is no outlet for their goal frustration (Berkowitz, 1993). Further, the breach-withdrawal relationship, almost axiomatic in the psychological contract literature (Suazo & Stone-Romero, 2011), is unlikely to be as strong in a safety context as it is illogical to respond with vengeance that ultimately harms oneself. Moreover, behaviours termed discretionary in non-threatening environments, such as keeping up-to-date with changes in policy, are unlikely to be deemed discretionary in safety-critical environments and thus are unlikely to be considered optional by employers (cf. Stone-Romero et al., 2009). Therefore, the differential withdrawal of discretionary versus in-role behaviour is likely to be less distinct. However, given the interdependencies of individuals working in safety-critical environments (Hofmann & Stetzer, 1996), the withdrawal of discretionary behaviours towards one's colleagues, such as

helping, are expected to be less evident than withdrawal of those towards one's organisation, such as making suggestions to improve safety.

Although no research was found that tested these hypotheses directly, safety studies have shown that individuals, who cannot retaliate organisational misbehaviour because of the penalties that might follow, inwardly direct their anger (O'Neill, Vandenberg, DeJoy, & Wilson, 2009). This introjected anger has consequences for their mental health (Deffenbacher, Oetting, Huff, Cornell, & Dallager, 1996), taxes their psychological resources (Gross, 1998a) and leads to displacement activity designed to alleviate the distress (Baumeister, Heatherton, & Tice, 1994). Consequently, individuals engage in unhealthy behaviours such as drinking more alcohol and smoking instead of exacting revenge on their employer (O'Neill et al., 2009).

In respect of on-going fulfilment, unusual or reversed relationships with outcomes are unlikely given the work is likely to be subject to the same social exchanges as witnessed in other work contexts (cf. Hofmann & Morgeson, 1999; Mearns & Reader, 2008) and thus upon receipt of some benefit, employees are likely to experience the same felt obligation to reciprocate (Walker & Hutton, 2006). Therefore, we should expect fulfilment to predict positive outcomes as it does in other organisational settings; employees who experience reciprocation are likely to experience good mental health (cf. Parzefall & Hakanen, 2010) and psychological well-being (cf. Guerrero & Herrbach, 2008). Additionally, when an employer is forthcoming on its commitments, individuals will comply with their prescribed job behaviours (Henderson et al., 2008) help out colleagues (Uen et al., 2009) and engage in less withdrawal (Sturges et al., 2005).

On the basis of the suppositions above, the following hypotheses are made:

Hypothesis 1a: Fulfilment positively predicts and breach negatively predicts psychological well-being, safety compliance, safety citizenship behaviour towards colleagues and the organisation.

Hypothesis 1b: Fulfilment negatively predicts and breach positively predicts unsafe and unhealthy behaviour.

RQ2a. What is the relationship of fulfilment and breach with violation?

A belief in reciprocal obligations is the cornerstone of psychological contract theory. However, this process does not reliably explain *why* individuals respond to psychological contract events with different types of behaviour (Conway & Briner, 2009). In line with Affective Events Theory (Weiss & Cropanzano, 1996), this thesis proposes and tests the proposition that affective experiences arising from fulfilment and breach connect health and safety behaviour to the

psychological contract; i.e. affect¹ acts as a motivational force to govern outcomes. A simple mediation model is offered in which fulfilment and breach indirectly predict health and safety behaviour through violation.

It is generally accepted now that breach is distinct from the feelings of anger, frustration and bitterness that violation encompasses (e.g. Conway & Briner, 2005, 2009) and thus violation is the affect-based construct deployed in this research defined as “the emotional and affective state that may, under certain conditions, follow from the belief that one’s organization has failed to adequately maintain the psychological contract” (Morrison & Robinson, 1997, p. 230). There appears to be no counterpart affective reaction for fulfilment defined in the literature and thus violation is also examined in relation to fulfilment.

In so doing, this thesis extends the application of AET to the safety domain. In addition, by adding fulfilment to the model, it also expands the work of Zhao et al (2007) and Suazo & Stone-Romero (2011) who focussed on the breach→violation →behaviour relationships. It thereby enables the differential effects of fulfilment and breach to be studied.

The motivation pathway

Weiss and Cropanzano (1996) theorised that events at work are often affectively laden; individuals react emotionally to the things that happen to them. Regardless of whether that emotional reaction is positive (joy, pride, love) or negative (anger, frustration, fear) the emotion *directly* influences the behaviour that results (p.13). Applying AET to psychological contracts therefore, the delivery (fulfilment) or absence (breach) of a promised or needed inducement is an event, which generates an affective reaction. It is the affective reaction to the delivery or non-delivery of the inducement that motivates behaviour immediately and in the longer term via work attitudes. It is this aspect of their *Affective Events Theory* (AET) that underpins this thesis’ proposal for the motivation mediation pathway.

Fulfilment and affect

There is a bias in the extant literature in favour of breach-affect studies, with few studies examining fulfilment-affect relationships. Consequently, there has been little research into the motivational consequences of fulfilment (Guerrero & Herrbach, 2008) and thus the positive

¹ A considerable array of terms exist to describe what a person feels, including affect, emotion, mood, stress, etc. and scholars such as Weiss and Cropanzano use these terms interchangeably as do psychological contract scholars (Bal et al., 2011). In this thesis, Gross and Thompson’s (2007, p. 8) definitional structure is adopted in that affect is seen as a superordinate category of states that include stress responses, discrete emotions such as anger, more diffuse moods such as feeling miserable or enthusiastic, and motivational impulses such as aggression.

outcomes associated with it are poorly understood. Another limitation is that psychological contract researchers often treat breach and fulfilment as two poles on a continuum (e.g. Robinson & Rousseau, 1994). This presumes that fulfilment is equal and opposite in its effects to breach and consequently only one aspect, usually breach, is studied (for an exception, see Conway et al., 2011) Thus, it is not clear what fulfilment's differential effect on motivation is when compared to breach.

In keeping with an AET perspective, it is proffered that the receipt of a valued and promised inducement induces positive affect as well as the perception that one's contract is being fulfilled. However, because not all obligations within an individual's psychological contract will necessarily be in a similar state of fulfilment (Turnley et al., 2003) the level of positive affect will vary.

Recent studies that have focussed on fulfilment have demonstrated that the employee's perception that the organisation values its contributions can be differentiated from the "uplifting" feelings that the employee experiences (Guerrero & Herrbach, 2008, p. 6) and have shown that the effects of fulfilment on affect are less positive than the effects of breach are negative when examined longitudinally (Conway, Guest, & Trenberth, 2011). However, these studies do not examine affect in relation to behaviour and thus the motivational force of fulfilment is not clear.

In respect of violation, it is examined almost entirely in relation to breach and not fulfilment. One exception, Vantilborgh (2015), reported a very large negative relationship between fulfilment and violation (-0.75) for volunteer workers. This effect overshadowed the positive effect of fulfilment on trust (0.46). Thus it would appear that fulfilment's motivational power is felt more strongly in terms of reducing negative affect than increasing positive affect. On this basis, the following hypothesis is made

Hypothesis 2: Fulfilment negatively predicts violation.

Breach and affect

A perception that one's employer has not honoured its *promised* obligations leads to individuals feeling wronged and cheated (Rousseau, 1989). Employees are apt to experience powerful emotions as they come to terms with the new reality of their employment relationship where their taken-for-granted assumptions about the exchange are no longer valid (Morrison & Robinson, 1997). It is argued here that these affective experiences are the propellant for

employees to alter their safety contribution, following the perception that their employer has not kept its side of the deal.

There is considerable evidence that breach is strongly associated with affective reactions with a recent meta-analysis placing the population correlations at 0.52 for violation and 0.65 for mistrust (H. Zhao et al., 2007). There are no reasons to suppose that employees in a safety context will have more muted affective reactions to their employer's renegeing compared to other employees, other than through the moderating effects of personal disposition (see below). Unfortunately, with the exception of O'Neill and colleagues, it appears that the role affect plays in a safety context has been overlooked with the majority of studies focussing on attitude, e.g. dissatisfaction (Barling, Kelloway, & Iverson, 2003a), rather than affect, e.g. anger. As discussed earlier, attitudes relate to judgement-driven behaviours such as turnover intentions, not the behaviours that are of interest in this thesis, e.g. safety citizenship. In accordance with AET, it is the affective reaction i.e. violation, that is the motivational force for behaviour and violation is experienced as a consequence of breach.

Thus, in keeping with the affect as motivation proposition, the following hypothesis is made:

Hypothesis 3: Breach positively predicts violation

RQ2b. What is the relationship of fulfilment and breach with cognitive failure?

As discussed in the foregoing, individuals regulate their attention in relation to work tasks as well as their effort (Kanfer & Heggstad, 1999). Heretofore, the extant psychological contract literature has almost exclusively devoted its efforts to studying how fulfilment and breach affect the motivation to perform rather than the capacity to perform. While psychological contract scholars have applied Hobfoll's conservation of resources model (Hobfoll, 1989, 2001), which holds that individuals are motivated to acquire resources and avoid losses, they use motivational measures e.g. engagement, rather than attentional measures that reflect cognitive functioning (e.g. Rayton & Yalabik, 2014). Yet, we know that emotions have the power to both facilitate and disrupt cognitive functioning (Forgas & George, 2001) with concomitant effects on individuals' on-task attention and behaviour (Beal et al., 2005).

This thesis argues that in order to understand the resource implications of fulfilment and breach, one has to deploy appropriate constructs that capture the regulation of attention drawing on theories that can account for effects of fulfilment and breach on cognitive functioning. Accordingly, this research offers ego depletion theory (EDT; Baumeister et al., 1998) and employs a measure of cognitive failure to capture the attentional resource

implications of fulfilment and breach. In so doing it offers unique insights into the unconscious processes intervening between psychological contract evaluations and safety behaviour.

To my knowledge, no researchers have used ego depletion theory directly to explain the effects of psychological contract events such as fulfilment and breach on behaviour. This research deploys a measure of cognitive failure, defined as the “cognitively based error that occurs during the performance of a task that the person is normally successful in executing” (Martin, 1983, p. 97), as a proxy for ego depletion. This measure captures the memory failures (forgetting where you put something), distractions (not being able to make a decision) and blunders (saying something which might be taken as offensive) associated with disruptions of the executive control function (Wallace, Kass, & Stanny, 2002).

The attention pathway

Self-control and the ability to initiate, inhibit or alter thoughts, emotions and actions in order to achieve goals is reportedly “one of the defining features of human behavior” (Legault & Inzlicht, 2013, p. 123). However, Muraven and Baumeister (2000) explain that this capacity for self-control is not limitless; each attempt to actively regulate one’s thoughts, emotions and behaviours depletes the self’s control reserves in the same way that muscles become fatigued after exercise. Furthermore, unlike working memory, they propose that this executive control aspect of the self is not reset to full capacity once individuals stop trying to initiate, alter or stifle a response. Rather, once this self-control resource is used, it must be replenished through rest to reach full strength once again. Without rest, Muraven and Baumeister (2000; p. 249) maintain, an individual’s self-control strength will become chronically deficient and individuals will experience self-control failure; i.e. they will no longer be able to manage natural impulses to ensure goal attainment and appropriate standards of behaviour. These premises underpin Baumeister and colleagues’ *ego depletion theory* (Baumeister et al., 1994) and form the basis for the attentional mediation of fulfilment, breach and safety behaviour proposed in this thesis.

Muraven and Baumeister (2000) propose two key demands that result in ego-depletion, which are directly relevant to this thesis; (1) coping with stress and (2) dealing with negative aversive emotions. First, ego depletion results because of the coping strategy individuals use to deal with stress. To manage stress, individuals inhibit automatic responses; a process that draws on self-control strength. For example, when the environment is threatening and unpredictable, individuals will cope by increasing their vigilance and regulating their attention to monitor for signs of further threat. This attentional control has consequences for other behaviours; for example, when subjected to loud uncontrollable noise, research participants increased subsequent risk-taking (Holding, Loeb, & Baker, 1983) and when subjected to a frustrating

experience dealing with bureaucracy, or discrimination, participants were less able to perform to standards on a subsequent proofreading task (Glass & Singer, 1972).

The second demand that results in ego depletion is managing negative emotions and arousal. In the emotional labour literature, it has been demonstrated that individuals who attempt to fake good and suppress bad feelings suffer greater emotional exhaustion and are poorer at service delivery than those whose affective experience and behaviour are consonant (Grandey, 2003). Support for ego depletion theory comes from experimental studies that have shown that individuals who are instructed to sustain attention, resist temptation, or suppress emotions perform significantly worse at subsequent tasks requiring persistence (Muraven, Tice, & Baumeister, 1998); at logic and reasoning tasks requiring concentration (Schmeichel, Vohs, & Baumeister, 2003); and at controlling aggression (Stucke & Baumeister, 2006).

It is worth noting that rather less attention has been paid to how the effects of ego depletion can be counteracted or reversed other than to suggest that individuals need to rest. Nevertheless, two recent studies have shown that positive affect induced by receiving an unexpected gift (Tice, Baumeister, Shmueli, & Muraven, 2007) and self-affirmation induced by having a cherished value confirmed, can replenish self-control strength (Schmeichel & Vohs, 2009). In a more recent study (Legault & Inzlicht, 2013), individuals performed better at a task where the context supported autonomy relative to individuals whose autonomy was undermined thereby indicating that having control over one's work preserves self-control strength too. However, these effects are only witnessed in individuals who are already ego depleted.

Fulfilment and attention

It is ventured here that delivered inducements associated with psychological contract fulfilment provide employees with the incentive to continue working and the positive affect that the receipt of an inducement generates helps in this regard by increasing the capacity to attend and concentrate on one's job tasks. Experimental studies reveal we are only willing to endure a certain amount, but that monetary incentives can motivate us to tap into those unclaimed reserves and can even completely erase the effect of ego depletion (Baumeister & Vohs, 2007, p. 10). Others studies show that the receipt of a small gift generates positive emotions sufficient to counter the tiredness experienced after the mental exertion associated with self-control (Tice et al., 2007). Furthermore, scholars who have examined the role of positive emotions e.g. Fredrickson (2001, 2004) present a case for a "broaden-and-build" model that suggests that positive emotions can expand action repertoires through their effects on attention and cognition.

Evidence of the ability of fulfilment to resource individuals is found in studies that have demonstrated fulfilment's association with work engagement (Bal & Kooij, 2010) and positive mental health (Guerrero & Herrbach, 2008; Parzefall & Hakanen, 2010) indicating fulfilment acts to resource individuals to promote psychological well-being. Evidence also exists that fulfilment equates to a job resource to reduce the emotional exhaustion that arises from job demands (Qin, Hom, Xu, & Ju, 2014). Psychological contract studies have also demonstrated that the delivery of promised resources such as administrative and financial support, can replenish those lost during extra-role efforts (Brown & Roloff, 2011). Furthermore, studies show that employees who have made extra efforts (e.g. working extra hours) perceive their organisation is obligated to provide more resources (Bal et al., 2011; Conway & Coyle-Shapiro, 2012) thereby demonstrating a reciprocal relationship between employee effort and employer obligations to provide further resources.

Thus, research that demonstrates fulfilment positively relates to work engagement provides evidence for fulfilment's ability to provide or replenish the cognitive and volitional self-control resources individuals need to maintain vigilance and appropriate standards of behaviour. Accordingly, it is hypothesised

Hypothesis 4: Fulfilment negatively predicts cognitive failure.

Breach and attention

As identified in the motivational control section above, individuals use behavioural strategies, such as retaliation, to reduce arousal. They also use active cognitive control strategies and attempt to either reappraise or suppress their bad feelings such as anger and fear. Muraven and Baumeister (2000) propose that, (1) coping with stress and (2) dealing with negative aversive emotions, known as emotion regulation (Diefendorff et al., 2008), results in ego-depletion. It is these cognitive strategies that individuals use to escape negative feelings generated by stressful psychological contract events that deplete their self-control reserves and result in cognitive failures. Each is related to psychological contract breach as will be discussed below.

Evidence for ego depletion comes from studies that examine the negative consequences of breach. Studies that investigate burnout and negative affect also demonstrate the deleterious effects of breach on people's mental capacities. As the strain of suppressing one's emotions to maintain task performance takes its toll, individuals begin to exhibit the signs of burnout (Rigotti, 2009), such as emotional exhaustion, depersonalisation and cynicism (Brown & Roloff,

2011; Chambel & Oliveira-Cruz, 2010; Gakovic & Tetrick, 2003; Jamil, Raja, & Darr, 2013; Johnson & O'Leary-Kelly, 2003).

Research in the field of burnout has demonstrated that individuals who report more symptoms of burnout also experience more cognitive failures in daily life, as well as commit more response inhibition errors (blunders) and have greater difficulty in maintaining attention (distractibility) (van der Linden, Keijsers, Eling, & van Schaijk, 2005). Furthermore, a systematic review (Deligkaris, Panagopoulou, Montgomery, & Masoura, 2014) concluded that burnout is implicated in a decline in executive control, attention and memory over the longer term.

While no studies have examined cognitive failure in relation to breach, on the basis of ego-depletion theory and the studies above, the following hypothesis is made:

Hypothesis 5: Breach positively predicts cognitive failure.

RQ2b. What is the relationship of violation with cognitive failure?

Individuals use various strategies, such as retaliation, to reduce arousal. They also use active cognitive control and attempt to either reappraise or suppress their bad feelings such as anger and fear. This is known as emotion regulation (Diefendorff et al., 2008) and is the second of Muraven and Baumeister's (2000) ego depleting demands in which reduces individuals' self-control strength leading to cognitive failures.

As already noted, bad moods, especially anger, have resource consequences for the individual due to the uncomfortable feelings they generate, feelings that individuals try hard to escape or alleviate (Gross, 1998a). Where individuals are not able to vent their anger against the protagonist because of the sanctions that might ensue and choose instead to take out their revenge on inanimate objects or innocent bystanders, their level of arousal is sustained through a process known as cognitive neoassociation (Berkowitz, 1993).

Negative events at work, such as an argument with one's boss, or frustration at one's treatment automatically initiate thoughts, memories, behaviours and physiological changes (heart rate) that trigger the archaic fight (anger) or flight (fear) response (Bushman, 2002). Essentially, this negative affect triggers an interconnected web of thoughts and memories associated with anger or fear that once stimulated or activated spreads to other connected thoughts, including, Bushman suggests, to aggressive ideas and violent action tendencies. Where circumstances do not allow an individual to act out their anger, or run away from their fear, the individual has to attempt to control those feelings and behaviours. It is this control that is ego depleting. The greater the efforts that individuals have to bring to bear to control their feelings, the greater the

demand placed on their cognitive resources. Muraven and Baumeister (2000) suggest that ultimately it will lead to self-control failure. On this basis, the following hypothesis is made:

Hypothesis 6: Violation positively predicts cognitive failures.

RQ3a. To what extent does violation mediate the relationship of fulfilment and breach with health and safety behaviour?

The proposition that affect acts as a motivational force for safety behaviour is central to the argument for a motivation mediation pathway. However, historically, the notion that the happier an employee is with his or her job or organisation the better they perform, and vice versa, has found little support (Iaffaldano & Muchinsky, 1985; Locke & Latham, 2002). AET suggests that if one looks at the affect-behaviour relationship rather than the attitude-behaviour relationship, the picture changes.

Affect and job behaviour

Events at work generate affective experiences, which invoke a behavioural response (Weiss & Cropanzano, 1996). This behavioural response is determined by the affect experienced; for example, when individuals experience positive affect they become more sociable, more inclined to engage with their environment and persist in their thinking (Fredrickson, 2001). When the work event results in unpleasant affect, individuals engage in behaviours designed to alleviate the unpleasant feelings, such as aggressive and revengeful behaviours to feel better (Spector & Fox, 2002), even though such behaviours may be irrational in terms of the negative consequences that might ensue (Cropanzano & Mitchell, 2005) and may actually inflame rather than dissipate emotional arousal (Bushman, 2002). Revengeful behaviours however, when targeted at the provocateur can actually be cathartic and reduce anger, although the reduction in anger people experience may make subsequent aggression more likely (Bresin & Gordon, 2013).

Thus, the behaviour that ensues an affective event may have more to do with managing the emotion than the event itself. It is when this affect-related behaviour facilitates job-focussed behaviour, e.g. behaving more sociably leads to more helping or spontaneity (George & Brief, 1992), or more satisfaction leads to more constructive voice (Hagedoorn, Van Yperen, Van de Vliert, & Buunk, 1999), does the affective experience relate positively to job performance (Weiss & Cropanzano, 1996). According to Weiss and Cropanzano, more often than not, these affect-related behaviours are incompatible with job-related behaviours; for example, distressed individuals disengage and withdraw in order to avoid the problem or engage in confrontation

consistent with a fight response (Dalal, Lam, Weiss, Welch, & Hulin, 2009). In effect, people are preoccupied with managing the affective experience and the more the behaviour is incompatible with their job responsibilities, the more disruptive it will be for their job performance.

Affect and safety behaviour

Although this thesis does not examine attitude-behaviour relations, the evidence that safety behaviours are influenced by affect comes almost entirely from studies that examine attitudinal-safety behaviour relationships. According to AET, attitudes are a summation of affective experiences at work and thus while rested on the same foundations, the time interval between event, affect, attitude and behaviour could be considerable thus accounting for the equivocal relationships with job performance.

As already discussed in Section 2.5.5, positive behaviours on the part of organisations and leaders have been shown to relate to workers' safety behaviour through affect-based constructs such as trust (Conchie, Taylor, & Donald, 2012); for example, trusting that one's leader cared related strongly to change oriented behaviours such as safety-specific voice (defined to include initiating change and whistle-blowing). Similarly, construction workers' intentions to engage in a variety of risk-related behaviour reduced the more care was demonstrated (Conchie & Burns, 2009).

Where negative affect is concerned, individuals in safety-critical environments are constrained in their ability to retaliate and thus must manage this aversive affect through other means, such as distracting behaviour, at some cost to their own health. O'Neill and colleagues (2009) demonstrated that an unsupportive organisation is associated with higher levels of anger and withdrawal behaviours such as accidents as well as unhealthy behaviour, such as alcohol consumption and high-risk behaviours (e.g. smoking); for every unit increase in anger, individuals increased alcohol consumption by 3.2 drinks per month and at-risk behaviours by 13% (O'Neill et al., 2009, p. 330). The affect-related behaviour is incompatible with in-role safety behaviour and thus interferes with job performance leading to accident involvement.

Two studies (Burns, 2007; Walker, 2013) have adopted a psychological contract perspective. Burns' study did not report results with outcomes due to its very small sample size and thus will not be discussed further. Walker (2013) demonstrated that injuries to employees predicted organisational trust perceptions, which in turn predicted perceptions of employer breach. Thus, they investigated the role of affect in predicting breach, not the role of breach in predicting affect. Nevertheless, their study demonstrated when injured at work, individuals trust their

employer less, perceive that it has reneged on its obligations more, and are less inclined to comply with their safety responsibilities.

As O'Neill et al.'s study demonstrates, individuals in safety contexts who experience anger and distrust of their employer experience lower psychological well-being and engage in unhealthy behaviour due to the inability to exact revenge. As Walker's study revealed, they also reduce their safety obligations and withdraw from their role prescriptions as well as discretionary aspects of their safety contribution.

Where positive affect is concerned given that positive mood is theorised to be a less potent motivator than negative mood (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), it is likely that fulfilment's positive effects on behaviour via violation will be modest at best. Thus, in line with AET, the following hypotheses are made

Hypothesis 7: Violation mediates the positive relationship of fulfilment with psychological well being, safety compliance, safety citizenship behaviour towards individuals and the organisation.

Hypothesis 8: Violation mediates the negative relationship of fulfilment with unsafe and unhealthy behaviour.

Hypothesis 9: Violation mediates the positive relationship of fulfilment with psychological well being, safety compliance, safety citizenship behaviour towards individuals and the organisation

Hypothesis 10: Violation mediates the positive relationship between breach and unsafe and unhealthy behaviours.

RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with health and safety behaviour?

The central propositions forwarded in the attention mediation pathway are that (1) fulfilment serves to replenish the attentional resources expended during work enabling an individual to sustain their safety behaviour and resist the temptation to act in ways that are detrimental to their health and safety performance; and (2) breach further depletes an individual's resources by making additional demands on their self-control reserves over and above those already exerted in the course of performing work tasks. Individuals experiencing breach will (a) divert precious attentional resources to monitor for further signs of breach sacrificing non-critical safety tasks; (b) spend their energies trying to manage their feelings rather than focussing their attention on their safety tasks; and (c) will experience self-control failure when their attentional resources are exhausted leading them to engage in unsafe and unhealthy behaviour.

Attention and job behaviour

Baumeister and colleagues propose that the types of acts requiring self-control include making choices and decisions, taking responsibility, initiating and inhibiting behaviour, making plans and carrying out those plans (Baumeister et al., 1998, p. 1252). As is self-evident, these activities are not the sole preserve of non-work life and many work tasks require the same overriding controls as implicated in those listed above, such as being vigilant and preventing one's mind from wandering, or following procedure even though there may be a quicker way to undertake the activity.

With regards task performance, Hockey (1993) explains that decrements in the primary task are very difficult to show in all but very sensitive tasks (such as vigilance) as individuals will compensate to sustain task performance, using different strategies as time progresses. First, they compensate by increasing subjective effort and physiological arousal (e.g. anxiety) in order to muster the energy they need for the primary task. Second, when the first strategy is unsuccessful to maintain task performance, they divert energy and attention away from secondary tasks; and third, when no more energy can be mustered, they resort to "low effort" choices that might be characterised as risky (p. 334). Therefore, we might expect individuals to reduce citizenship behaviour in their attempts to maintain task performance. Eventually, and without respite, the individual will give in to impulse and engage in counterproductive behaviour. Where individuals are made happy by the benefits they receive, have their value confirmed, or are afforded autonomy in their work, we might expect individuals to be able to sustain self-control and thus performance across the task and citizenship divide.

Cognitive failure and safety behaviour

In the world of workplace safety, evidence regarding the ego depleting effects of psychological contract events on safety behaviour is easier to find than for motivating effects of affect. However, the extant safety literature does not draw on psychological contract theory, or on theories of ego depletion. Rather, it examines the effects on behaviour of supporting or stressful aspects of jobs, leadership behaviour and organisational climate (see Section 2.2 in the chapter on safety behaviour).

Studies that connect supportive workplaces through cognitive states to safety behaviour are very rare. Nahrgang et al (2011), demonstrated, across industries, a supportive work environment was the most beneficial resource for reducing unsafe behaviour. Its effects were conducted through burnout such that the more resourced individuals were, the less burnt out they were and the less they became involved in adverse events. Predominantly, safety studies

interpret the role of job resources as being motivational in nature. This thesis argues that job resources relate to safety through the cognitive capacity to engage, an argument that is supported by the finding that resources and burnout are negatively correlated (Crawford, LePine, & Rich, 2010) and engagement has stronger relations with safety performance of business units than satisfaction has (Harter, Schmidt, & Hayes, 2002).

Hypothesis 11: Cognitive failure mediates the positive relationship between fulfilment and safety behaviour.

Hypothesis 12: Cognitive failure mediates the negative relationship between fulfilment and unsafe behaviour.

Where the stressful aspects of work are concerned, the theories on which safety studies draw, such as the Job Demands Resources model (Demerouti, Bakker, De Jonge, et al., 2001), do not fully account for some findings, such as the equivocal relationship of job demands with safe behaviour (cf. Parker et al., 2001). Individuals engaging in highly hazardous and risky work, in jobs that are complex, and working for organisations that do not take care of their well-being suffer from burnout and are more at risk of being involved in a near-miss or accident (Nahrgang et al., 2011). Yet, in other studies, jobs characterised by risk and hazards do not lead to burnout but to reduced safety compliance instead (Clarke, 2012). It is argued here that ego depletion as a consequence of breach can account for these somewhat contradictory results as will now be explained.

Muraven and colleagues (1998) demonstrated that tasks requiring effort, or that are difficult, do not automatically induce depletion unless they require some form of executive intervention from the self. For example, those participants solving a difficult maths problem did not perform as badly on a subsequent test of self-control as those who first had to suppress their thoughts on another task did. Similarly, negative mood and arousal in isolation do not cause performance decrements; individuals with a negative mood only fail to resist temptation, such as eating chocolate, when they first have to exercise self-control on another task (Baumeister et al., 1998). In a safety context, it is ventured that it is not the workload *per se* that causes unsafe behaviour, it is the need to exercise self-control, such as sustaining effort *and* managing negative emotions that results in subsequent rule violation.

Hockey's (1993) model of energy control advocates that as more demands are made on individuals' resources, the more sacrifices they have to make in order to sustain primary performance. Given the sanctions associated with the withdrawal of in-role behaviours in a safety domain, it is likely that as more demands are made on individuals, and demands in the

sense of self-control demands, the more likely it is that they will withdraw extra-role behaviours (Janssen, Lam, & Huang, 2010) such as keeping up-to-date with changes in procedures, than in-role behaviours, such as complying with safety rules.

Beal and colleagues (Beal et al., 2005) suggest that the attentional pull of the task will also interact with the self-control strength to influence where individuals' energies are diverted. The greater the pull of the task in terms of its importance, complexity, or interest to the individual, the more individuals will bring their resources (knowledge, skill, energy) to bear on the task and thus tasks low on attentional pull are likely to suffer most.

This theorising has been supported in safety studies. Chen and Chen (2014) demonstrated that as job demands increased for flight safety attendants, the safety behaviours impacted most heavily were, (in order of effect size): upward safety communication, followed by extra-role safety behaviour, with in-role safety behaviour being least affected. Similarly, another study demonstrated that individuals who have had arguments at work and had to carry out tasks without adequate people (stress inducing events) are less likely to assist others in their work (Sampson, DeArmond, & Chen, 2014). Further, this impact on helping behaviour is far greater than the impact on in-role behaviour, such as an individual's willingness to comply with safety rules.

Safety studies have also demonstrated that exhausted individuals, with little or no control over how they respond to their job demands, will resort to low effort strategies such as taking short cuts (Hansez & Chmiel, 2010) or bypassing procedures that slow them down (workarounds; Halbesleben, 2010). Halbesleben also showed that workarounds and injury involvement were related, indicating that these unsafe practices are indeed high-risk strategies.

In line with the theoretical propositions above, the following hypotheses are forwarded:

Hypothesis 13: Cognitive failure mediates the negative relationship between breach and safety behaviour.

Hypothesis 14: Cognitive failure mediates the positive relationship between breach and unsafe and unhealthy behaviour.

The last stage in ego depletion process is self-control failure, where individuals no longer have the resources left to maintain task performance, they begin to engage in "low effort" actions such as risky behaviour (Hockey, 1993) and are unable to reign in their impulses and thus engage in organisational deviance. Restubog and colleagues (Bordia et al., 2008; Restubog, Zagenczyk, Bordia, Bordia, & Chapman, 2015) have been particularly active in this area and

their work illustrates the link between violation and self-control failure; individuals low in self-control (measured as a trait), who felt a sense of violation engaged in significantly more interpersonal (teasing coworkers) and organisational deviance (taking undeserved breaks) than those high in self-control.

When it comes to safety behaviour, Wallace and Vadonovich (2003a) demonstrated that individuals who reported more cognitive failures had significantly more self-reported unsafe behaviour, accident involvement and more general performance problems. Ahola and colleagues demonstrated that for each unit increase in burnout scores, the risk of injury increased by 9% demonstrating a significant link between burnout and injuries (Ahola, Salminen, Toppinen-Tanner, Koskinen, & Väänänen, 2013) that might potentially be attributable to the vigilance decrements and attentional narrowing that happens in response to the ego depleting effects of stress.

Hypothesis 15: Unsafe behaviour mediates the positive relationship of breach with accidents via violation and cognitive failure.

Hypothesis 16: Unhealthy behaviour mediates the positive relationship between cognitive failure and health outcomes.

RQ4a. To what extent does self-regulatory focus moderate the relationship of breach with violation and cognitive failure?

RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with behavioural outcomes?

These final research questions concern the first aim of the thesis and investigate the individual differences that can moderate the impact of breach on affect and attention (RQ4a) and moderate the impact of affect and attention on behaviour (RQ4b).

Individuals differ in respect of their goal focus and the strategies they use to control their expression of negative emotions. These habitual behaviours are known in lay terms as professionalism (Personal communication, 2011) and in psychological terms as self-regulatory focus (Higgins, 1997, 2000) and emotional regulation strategy (Diefendorff et al., 2008). This last section presents the theoretical basis for the moderating effects of these two individual differences.

The moderating effects of self-regulatory focus on the relationship between breach and violation and between breach and cognitive failure

According to self-regulatory focus theory (Higgins, 1997, 2000) individuals' focus is either habitually oriented to production goals wherein individuals will expend their energies fulfilling their desires to obtain rewards or towards preventing performance problems and thus their energies are devoted to making sure they are diligent in their work. Thus, a production-focussed individual is oriented towards making gains and is likely to be sensitive to accomplishment losses whereas a prevention oriented individual is likely to want to avoid losses and is sensitive to feedback that signals a mistake has been made (Higgins, 1997, p. 1285).

The emotional consequences for a production-focussed individual of failing to obtain a desired reward are feelings of sadness and dejection. On the other hand, a prevention-focussed individual who uses vigilance to ensure the avoidance of losses, agitation and anxiety are the likely emotional consequences of an unavoidable loss (Brockner & Higgins, 2001).

However, this aspect of Higgins's theory only refers to the emotional consequences of habitual self-regulatory focus when an individual's goals are frustrated. Additionally, individuals are likely to have developed underlying skills that enable them to obtain maximum benefit from their orientation (Heggestad & Kanfer, 2000; Kanfer et al., 1996). Individuals with a production orientation develop effective motivational control strategies that enable them to persist longer to ensure they obtain their desired reward (Kanfer et al., 1996). Those with a prevention focus will have developed emotional control strategies that enable them to keep their anxieties at bay and avoid mistakes. Additionally, in a safety context, the emphasis on a prevention-regulatory focus is likely to predominate and shape an individual's habitual responses (Wallace & Chen, 2006).

Applying the skill perspective of self-regulatory focus, individuals who are stronger in orientation on the foci are likely to suffer fewer of the negative emotional consequences of goal frustration than their colleagues whose self-regulatory focus is less pronounced. Individuals with weaker orientations are likely to have under-developed motivational (production) and emotional (prevention) control skills. Such individuals are likely to suffer the emotional consequences of breach to a greater extent than their contemporaries.

Thus, in accordance with Higgins's propositions, breach will lead to heightened frustration and violation in the low production-focussed individuals and heightened anxiety and vigilance in the low prevention-focussed individuals. Accordingly, the following hypotheses are made:

Hypothesis 17a: A strong production-focus dampens individuals' feelings of violation in response to breach.

Hypothesis 17b: A strong production-focus heightens individuals' susceptibility to cognitive failure in response to breach.

Hypothesis 18a: A weak prevention-focus heightens individuals' feelings of violation in response to breach.

Hypothesis 18b: A weak prevention-focus heightens individuals' susceptibility to cognitive failure in response to breach.

The moderating effects of emotion-regulation strategy on the relationship between violation and behaviour and between cognitive failure and behaviour

Individuals also differ in the extent to which they deploy emotion-regulation strategies and are able to “keep their cool” (Richards & Gross, 2000) when faced with adversity. Two broad categories of strategy exist: antecedent-focussed and response-focussed emotion-regulation (Gross, 1998b). When individuals employ the first strategy, they reappraise how they perceive the negative event and thus dampen the negative feelings they experience. When individuals use the second class of strategy, they suppress the emotional response and try and alter the emotions they display. Such suppression comes at a price and consumes self-control strength. Individuals who also continue to think about the event maintain their levels of arousal. This rumination (Gross & Thompson, 2007) quickly exhausts self-control strength (Bushman, 2002; Genet & Siemer, 2012).

An individual's choice of strategy is therefore likely to interact to moderate both the experience of violation to make intentional safety behaviour withdrawal more or less likely and the ego depletion pathway to make self-control failure more or less likely and thus unintentional withdrawal of safety behaviour more prevalent.

Hypothesis 19a: Antecedent-focussed emotion-regulation dampens feelings of violation preserving motivation to behave safely

Hypothesis 19b: Response-focussed emotion-regulation heightens feelings of violation eroding motivation to behave safely.

Hypothesis 20a: Antecedent-focussed emotion-regulation reduces cognitive failures preserving capacity to behave safely.

Hypothesis 20b: Response-focussed emotion-regulation increases cognitive failures eroding capacity to behave safely.

5.3 Method

5.3.1 Context

The context for this study is the international commercial shipping industry. This comprises the world's merchant navies, fleets of commercial ships and their crews that transport the world's goods, raw materials and people across the oceans. The industry employs approximately 1.2 million seafarers worldwide (International Chamber of Shipping (ICS), 2015) working on-board over 85,000 ships ranging from small general cargo ships to very large oil tankers (Equasis, 2015). The mortality rate for British seafarers is 27.8 times higher than the general working population (Roberts & Marlow, 2005) and six times higher for Danish seafarers than workers ashore (Borch, Hansen, Burr, & Jepsen, 2012). In terms of accident rates, an international study found that thirty per cent of seafarers in a telemedicine database had had an accident in the period from 2008 to 2011 (Lefkowitz, Slade, & Redlich, 2015), and Hansen et al (Hansen, Nielsen, & Frydenberg, 2002) concluded on the basis of data from the Danish Maritime Authority that Danish seafarers were at risk of experiencing an accident every 15.63 years worked. Seafarers not only suffer accidents, they also have accidents attributed to them with marine accident investigators reporting between 49% and 96% are caused by seafarer error (Hetherington, Flin, & Mearns, 2006).

Due to the inherent risks to life, environment and property associated with working at sea, the industry has implemented wide-ranging safety standards to which ships have to comply (ICS, 2015). While the laws of the sea are designed to uphold these standards, they are also designed to ensure free trade (Alderton & Winchester, 2002). In recent years, open registers have appeared and ships's owners can register their ships in nations other than their own and thus recruit individuals from the international labour market. Unions and labour organisations view these open registers negatively as they are associated with poorer safety standards, poorer pay and conditions, work intensification and increased stress levels for seafarers than found in traditional national registers (Alderton, 2004).

These changes and statistics suggest there is an urgent need to understand the employment relationship and its effects on seafarer well-being and safety behaviour. According to Sampson and Bloor (2012, p. 62), in future the maritime industry may not be an isolated or "critical case" where failure of global governance is concerned and we may see other globalised industries side step regulation and enforcement with similar consequences for their workforces. Thus, there may be future benefit in studying this population as globalisation transforms other industries.

5.3.2 Sample selection

The merchant shipping industry was chosen as the context for the studies as it is considered safety-critical on account of the hazardous working conditions that its employees face and the sensitivity of the cargoes that ships carry, from passengers to crude oil and toxic chemicals. Organisations were approached from across the sectors of the merchant shipping industry, including ship owning as well as ship managing (outsourced) companies and through the International Tanker Owners' Association (INTERTANKO) via their weekly newsletter. INTERTANKO is a trade association for the petroleum and gas shipping industry and for whom the researcher acts as a committee vice-chair. Three organisations volunteered out of a possible 120, of which two went on to participate in the empirical research studies; one, a ship owning family run company, and the other a ship managing corporate run organisation.

The data arising from these samples contributes to the research on psychological contracts and safety performance because (a) the research participants are all employees of the companies involved and not students, and (b) they all perform work that has health and safety consequences if not performed correctly or if withdrawn in any way. Lastly, the benefit of studying the behaviour of such workers is that they do not return home at the end of each day and thus are largely cut-off from non-work influences on their behaviour, such as family and friends. Therefore, the employment relationship can be studied with less influence from the effects of spill over and work-life balance.

Sample

Participants worked for two merchant navy shipping companies, the first is a limited ship-owning company based in Denmark (hereinafter referred to as Company A) and the other a UK-based division of a large Asian multinational ship management company (hereinafter referred to as Company B). The first company operates three fleets of ships trading in dry bulk, crude oil, and petrochemical products. The second company operates a fleet of gas tankers. Between them, the companies operate a total of 83 ships that trade internationally. Company A's ships carry an average of 22 personnel on-board and Company B's ships an average of 34. Participants who work on-board these ships do so in the navigation, engineering or catering departments and as managers, officers, ratings or trainees. Data collection was carried out between August 2013 and June 2014. The participants were on a variety of different employment contracts ranging from permanent salaried members of staff, to individuals working on fixed-term temporary contracts. All Company B participants were on-board ship at the times the surveys were completed. At the time of the survey, participants from Company A

were either on-board ship, ashore on leave or ashore in the office; at Time I, 89% of respondents were at sea; at Time II, 98% of respondents were at sea.

Participants

In Company A, the first and the second waves of the study were sent out to all seagoing employees whether on-board ship or ashore. In Company B both waves of the survey were sent to employees on-board ship only. The latter company's data protection policy did not allow its staff ashore to be contacted. Company A's response rate at Time 1 was 504 (23%) of which 482 were valid returns. Company B's response rate was 284 (55%) of which 268 were valid returns. Company A's response rate at Time 2 was 476 (22%) of which 390 were valid returns and Company B's 376 (64%) of which 239 were valid returns. The online and Excel versions of the survey returned responses that had been opened but respondents declined to complete thus accounting for the discrepancy in valid returns. In total 1,379 valid returns were received over both waves of the survey, 750 at Time I and 629 at Time II. In total 1,278 respondents completed the survey once and 101 completed the survey twice, 61 from Company A and 40 from Company B.

The reason for the large discrepancy in completions at T2 is in part due to the constantly changing complement of crew on-board. The length of an individual's contract on-board varies from 11 weeks to more than 9 months. Furthermore, individuals may be on agency contracts and thus have only one period of employment with the company. Therefore, at the times of each survey, employees may have just joined the ship, may be in the middle of their contract, just about to leave the ship or company, already ashore on leave, or in alternative employment. At the end of their contract individuals are relieved by new crewmembers. Thus, the ship's complement is constantly changing. Fewer individuals who completed the survey at T1 were on-board at T2 than had been anticipated. In addition, the T2 sample included more new respondents than anticipated. The additional respondents completing the survey for the first time at T2 were either on leave at the time the survey was first distributed or were new to the company.

Table 5.1
Sample demographic statistics

Variable	Sample					
	Company A			Company B		
	Time I	Time II	Time I & II	Time I	Time II	Time I & II
Total respondents	482	390	61	268	239	40
Modal age category (years)	30 - 39	30 - 39	30 - 39	30 - 39	20 - 29	20 - 29
Male respondents	422	100	56	264	228	39
Female respondents	13	–	–	–	1	–
European (%)	39 (8)	16 (6)	8 (13)	110 (41)	41 (17)	23 (56)
Indian (%)	162 (34)	47 (16)	32 (52)	26 (10)	32 (13)	4 (10)
Asian (%)	243 (50)	103 (36)	17 (28)	127 (47)	157 (65)	13 (32)
Modal level of education	4-yr College	4-yr College	4-yr College	4-yr College	4-yr College	4-yr College
Managers (%)	84 (17)	31 (11)	19 (31)	16 (6)	9 (4)	3 (8)
Officers (%)	159 (33)	82 (29)	21 (34)	77 (29)	45 (19)	14 (35)
Ratings (%)	146 (30)	81 (28)	8 (13)	93 (35)	126 (52)	9 (23)
Role unreported	93	87	11	82	62	14
Union membership (%)	336 (70)	70 (25)	52 (85)	173 (65)	169 (70)	29 (73)
Modal tenure (years)	6 - 10	6 - 10	6 - 10	6 - 10	6 - 10	3-5
Modal contract type	Agency	Agency	Agency	Salaried	Agency	Salaried
Modal tour of duty (months)	>6 <12	>6 <12	<4	<4	>6 <12	<4
Modal work leave ratio	1:1	1:1	1:1	1:1	4:1	1:1
Modal experience (years)	11 - 20	11 - 20	11 - 20	11 - 20	11 - 20	3 - 5

Notes. N (Time I) = 767; N (Time II) = 510; N (Total Time I & II) = 1,277; N (Longitudinal) = 101; – Denotes no females respondents identified.

Sample characteristics

An overview of the samples is presented in Table 5.1. On the first wave of the survey [Company A, Company B] 88%, 99% of the sample was male. Fewer than 15 females took part in the study, comprising 1% of the total number of respondents. This figure is consistent with employment rates of female seafarers reported elsewhere (Belcher, 2003). Accordingly, gender does not feature in any further analyses. The most frequent age category was 30 – 39 across all samples for Company A and the first sample for Company B. For the second wave and longitudinal samples for Company B, the most frequent age category was 20 – 29.

The composition of the sample according to nationality varied between samples and between companies. For both Company A and Company B, the highest percentages of respondents taking part in the first and second waves of the study were people of Asian origin [Company A 50%, 47%; Company B 36%, 65%], reflecting both companies' dominant ethnic group. The highest proportion taking part in the longitudinal study was people of Indian origin for Company A (52%) and of European origin (56%) for Company B. The most frequent level of education was consistent across samples and companies [4-years of college].

Individuals were categorised as having roles in one of three job families: deck, engine and catering. The deck department is responsible for navigating the ship from A to B; the engineering department is responsible for maintaining the ship's systems such as propulsion; and, the catering department provides food and hospitality services to the ship's complement.

Respondents also hold job roles at one of three levels: managers, which includes captains and chief engineers; officers (white collar) who hold professional licences for different levels of responsibility; and ratings (blue collar) who are semi-skilled workers. Officers were represented in greater proportions than other roles in all waves of the study for Company A [33%, 29%, 34%], reflecting the organisational structure for seagoing staff. Ratings were most represented in the first and second waves of the study for Company B [35%, 52%] and officers in the longitudinal study [35%]. Ratings are employed in greater numbers in Company B than Company A and in greater numbers than in other job roles within Company B.

The majority of respondents in both companies and over all samples were union members, with the exception of the second sample for Company A. Of those providing demographic information, 25% were union members compared with an average of 73% for all other samples.

Individuals were employed on a variety of contracts ranging from full-time salaried staff (paid when on leave), permanent (paid when on-board only), agency (outsourced), temporary (employed for the voyage only) and trainee. At T1 and for Company A, 5.8% of the sample were

full-time, salaried, 6.8% were trainees, 12.7% were on temporary contracts, 16.2% were permanent employees, and 50% were on agency contracts. For Company B, 1.5% were trainees, 3% were on temporary contracts, 9% were permanent employees, 33.2% were on agency contracts and 51.5% were full-time, salaried staff. For Company A, the majority of respondents were on agency contracts for all 3 samples. For Company B, the first wave and the longitudinal sample were predominantly full-time, salaried employees whereas the second wave of the survey was predominantly agency workers.

The tenure of employees was consistent across all samples except the longitudinal sample for Company B. Most respondents had been with the company between 6 and 10 years, but only between 3 and 5 years for the respondents taking part in both waves of the survey.

Individuals' tour of duty varied from less than 4 months to over 12 months, with the average tour length greater than 6 months but less than a year. Company A employees were more likely to spend longer on-board than Company B with 66% of the sample at T1 likely to spend between 5 months and a year on board. For Company B, the proportion spending up to a year on-board was 51.9% with 45.1% on-board less than 4 months. With the exception of the second wave for Company A, the work to leave ratio for most employees in both companies was 1:1, 1 day's leave for each day worked. Contract type, tour length and work to leave ratio go together with salaried and permanent employees having shorter tours than agency and temporary employees. Therefore, only contract type is carried forward into future analyses.

Overall, there are no significant differences between the samples, except for the longitudinal study; individuals who took part in both waves of the study in Company B are employees who are less experienced than individuals who took part in either the first or second wave of the study.

5.3.3 Procedure

The survey was administered electronically via one of three means. (1) Anonymous links to an online version of the survey were sent to the captains of ships with Internet access. The captains distributed the anonymous links to all persons on-board. (2) Individuals ashore were sent anonymous links to complete the survey online to their personal email accounts. (3) Ships without Internet access were sent anonymous Excel files containing the survey that the ships' captains distributed and returned. Conditional formatting and hidden worksheets enabled the responses to be concealed within the files. T1 and T2 responses were matched by a respondent-generated code. Both the online and Excel versions of the survey contained instructions for completion. Informed consent was sought from all respondents. Respondents were given one month to complete the survey and were sent reminders at weekly intervals. The second wave of

the survey was initiated six months later. Six months was chosen as the time interval, as the majority of those completing the survey should have experienced at least one period of employment on-board ship and thus had some interaction with the shore-side management.

Ethics

Informed consent was sought from all participants wherein the risks and benefits of participating in the study were explained prior to the respondent indicating their willingness or otherwise to contribute (see questionnaire at Appendix C). Participants could withdraw from the study at any time without explanation. Anonymity was preserved by asking all respondents to create their own unique code. The codes did not enable the individual to be identified. The researcher was able to match Time I with Time II responses by matching the code contained in the questionnaires.

Self-report measures

In all measures deployed to assess behaviour, individuals are asked to self-report. While this reliance on self-reports might be deemed problematic and result in higher inter-dimensional correlations (Sackett, 2002), there are three reasons to support the use of self-report measures. First, scholars have demonstrated that self-reports of safety behaviours are related to independent observations (Probst, 2004). Second, self-reports of accidents and unsafe behaviours are subject to social desirability, which suppresses reporting thereby attenuating possible relations between predictor and criterion rather than inflating them (Probst, 2004). Third, supervisor-reports can underestimate unsafe behaviours (Lusk, Ronis, & Baer, 1995) as such counterproductive behaviours are often hidden from others and only known about by the respondent (Sackett, 2002).

Measure of psychological contract fulfilment

Transactional and relational dimensions

A measure of transactional and relational fulfilment was constructed by compiling a list of obligations from previous research studies (Coyle-Shapiro & Conway, 2005; De Vos, Buyens, & Schalk, 2003; Kickul et al., 2002; Robinson, 1996; Robinson et al., 1994; Rousseau, 2008). This list of 93 psychological contract obligations was then presented to sixteen HR managers in shipping companies who indicated whether their company offered the items listed. Three additional items were included reflecting obligations related to working on-board ship: *timely relief at the end of the contract, opportunities for rest and recreation at sea, opportunities to communicate with friends and family at sea.*

The resultant 21 items came from either transactional or relational psychological contract dimensions. Items more oriented to performance (Rousseau, 2008) and work-life balance (De Vos et al. 2003) were not chosen by all ten managers who responded and thus are not included in the list of obligations presented to survey participants.

These 21 items were carried forward into the survey and presented to respondents who were asked to indicate the extent to which their employer had met its obligations on the items listed (see items in questionnaire at Appendix C). The transactional fulfilment dimension contained 8 items; for example, “Fair pay for the level of accountability and responsibility in the job”. The relational fulfilment dimension contained 13 items; for example, “Opportunities for promotion and advancement”. Further details of the stem question and the response options are presented in the next section.

Safety dimensions

The safety psychological contract scale developed by Walker and Hutton (2006) is the only validated measure of employers’ safety obligations. Twelve items were chosen with the highest factor loadings on the two sub-scales of *Employee Safety Interests* (ESI) and *Provision of Resources* (POR). Two further items were included and adapted, as these were deemed highly relevant to a shipping context: *Ensure that safety incident investigations do not focus on blame* and *Supply enough human resources to get the job done safely* (cf. Hetherington et al., 2006). The resultant ESI dimension contained 8 items, for example, “Involve employees in safety decision-making”. An example of the resultant POR dimension, which contained 6 items was, “Supply proper work equipment”.

In total, thirty-five psychological contract obligations were presented and individuals rated the extent to which their employer had met its obligations and commitments on the items listed. Due to problems associated with difference scores (Edwards, 2001) a directional approach was adopted after Bal et al. (2011) whereby individuals indicated the extent to which their employer had (1) “Fallen far short of its obligations”, through (3) “Met its obligations” to (5) “Far exceeded its obligations”. Whereas Bal et al. assessed the direction of evaluation in relation to promises (much less – much more), this thesis assesses the direction of employee evaluations in relation to obligations. This measure should therefore reflect the on-going nature of the psychological contract by allowing respondents to indicate which obligations have been fulfilled and which were *as yet* unfulfilled for reasons of timing; i.e. the individual may have only just made their contribution for which, at the time of the survey, they had not received the inducement.

A “No promise made” response option was also included as has been done by other researchers (e.g. Conway & Coyle-Shapiro, 2012) so that individuals could indicate items that their organisation was not obligated to provide as no promise had been made. These responses are treated as missing data in subsequent analyses. Cronbach’s alpha at Time I for each of the dimensions was as follows: *transactional* (0.85); *relational* (0.91); *employee safety interests* (0.91); *provision of resources* (0.89).

Subsequent confirmatory factor analyses indicated poor discriminant validity between the latent dimensions of transactional, relational, ESI and POR obligations. Following the method outlined by (Landis, Beal, & Tesluk, 2000) item parcels were created reflecting the facets of transactional, relational and safety obligations that loaded onto the factor psychological contract fulfilment. The results section below discusses the confirmatory factor analyses in more detail.

Global breach

As the composite list of obligations presented above might not cover all obligations in a psychological contract, a global assessment of breach is also included where respondents were asked to indicate whether or not their employer had abided by the promissory exchange agreement. Four items, two breach and two fulfilment, were taken from Robinson and Morrison’s (2000) widely used measure of psychological contract breach. This measure is conceptually distinct from the fulfilment measure above in that it asks participants to respond to statements that indicate the employer has or has not honoured its promises. For example, respondents rated the extent to which they agreed with statements such as “I have not received everything promised to me in exchange for my contributions” on a five-point scale where (1) = strongly disagree and (5) = strongly agree.

The fulfilment measure above provides an open-ended time frame and leaves unanswered the question as to whether the employee has delivered on his or her commitments. Thus, an employer who is deemed to have “far exceeded its obligations” may have been adjudged thus simply because the employee has yet to make their own contribution to the exchange. An employer, who is deemed to have “fallen short” on some commitment, may be so adjudged because they have yet to come through on their commitments, not because they have reneged on their promises. In this global breach measure, the respondent is being asked to report whether they *conclude* the employer has or has not delivered on its promises; i.e. the employer has or has not fulfilled their part in the exchange agreement and this is somehow evident from its behaviour. The two reverse-scored fulfilment items were included to help prevent undesirable response sets involving acquiescence or resistance (Nunnally, 1967). Individually,

each of the four items was allowed to load onto the factor global breach. Cronbach's alpha (α) was 0.74 at Time I and 0.76 at Time II indicating adequate internal consistency.

Psychological contract violation

The affective reactions to breach and fulfilment are assessed using four items of Robinson and Morrison's (2000) measure of psychological contract violation. This measure establishes the extent of an individual's affective reaction to psychological contract events, including feelings of anger, betrayal, frustration and violation. The respondents were asked to score the extent to which they agreed with statements "I feel a great deal of anger to my employer" on a 5 point scale from 1 (strongly disagree) to 5 (strongly agree). The four items were allowed to load individually onto the factor psychological contract violation. The scale demonstrated good internal consistency at Time I and Time II ($\alpha = .91$).

Cognitive failure

Ego depletion is operationalised by assessing individuals' self-reported cognitive failures using Wallace et al.'s (2002) Cognitive Failure Questionnaire (CFQ). The CFQ assesses four dimensions of cognitive functioning: memory failures, distractibility, blunders and forgetting names. The CFQ has frequently been used in safety studies and is the only measure that includes indicators of ego depletion such as attentional difficulties "Do you have trouble making up your mind?" and self-control failure "Do you lose your temper and regret it afterwards?" as well as having been validated on the work performance of individuals in safety-critical settings and safety-related outcomes, e.g. accidents (Wallace & Vodanovich, 2003a). Three items from each dimension (except names, which only has two items) with the highest factor loadings were chosen and the item wording adapted so it was applicable on-board a ship (some items referred to going shopping which you cannot do at sea). Respondents were asked to indicate how often they did the things listed where 1 indicated "Never" and 5, "All of the time".

The individual dimensions were highly correlated (mean .77) and thus composites of items on each dimension were constructed to form four item parcels loading onto the single latent construct of cognitive failure. The reliability of the composite scale of cognitive failure was $\alpha = .80$ at Time I and $\alpha = .84$ at Time II.

In-role safety behaviour

Twelve items were taken from Burke et al.'s (2002) measure of general safety duties. The measure is divided into four second-order factors as described in Chapter 2; namely "Using Personal Protective Equipment" (UPPE), "Engaging in Work Practices to Reduce Risk" (EWPRR),

“Communicating Health & Safety Information” (CHSI) and, “Exercising Employee Rights and Responsibilities” (EERR). Although the measure was developed and validated in a nuclear power context, slight adaptation of the item wording ensures the measure is applicable to a shipping context. First, items were chosen that loaded most highly on the second-order factors. These items were then presented to a group of eight Subject Matter Experts (SMEs) who indicated the items where all or most employees on-board ship would be expected to carry out the safety duties listed. This exercise resulted in the three most relevant items per factor being included in the study. The respondents were asked to indicate the frequency with which they could be expected to perform the safety duties when required. Respondents used a scale that ranged from 0 (Never) to 6 (Always).

Validity estimates indicated that two of the four factors had poor discriminant validity; namely, EWPRR and CHSI. The three items per dimension were averaged to create the indicators for the latent factor “in-role safety behaviour”. Thus, four item parcels were constructed that loaded onto a single latent factor of in-role safety behaviour and reflected the four individual dimensions identified above. A single measure of in-role safety behaviour was employed whose internal reliability was $\alpha = .75$ at Time I and Time II.

Safety citizenship behaviour

Hofmann et al.’s (2003) measure of safety citizenship behaviour (SCB) was specifically developed for safety studies and was chosen to assess the contextual component of safety behaviour in this study. The original measure contains 27 items and thus better represents the construct than other shorter measures of contextual safety performance. The items are structured into six facets; *helping, voice, stewardship, whistleblowing, civic virtue, and initiating change*. The facets are highly intercorrelated (Conchie & Donald, 2009) and as with other multi-dimensional measures of citizenship (Podsakoff, MacKenzie, Paine, & Bachrach, 2000), items do not always load onto the factor they are supposed to reflect (Turner et al., 2005). However, the original construct of organizational citizenship from which Hofmann et al.’s scale is devised, was differentiated into behaviour targeted at individuals and behaviour targeted at the organisation (Smith et al., 1983).

In psychological contract studies, this distinction is important as employees have been shown to withdraw organisationally-relevant citizenship behaviour but preserve behaviour directed at other targets (Conway et al., 2014). Thus, this study conceptualises SCB as a bi-dimensional construct with items reflecting behaviour targeted at co-workers (SCBI) and behaviour targeted at the organisation (SCBO).

The Subject Matter Experts (SMEs) were asked again to indicate the items most representative of behaviour in a shipping context and this exercise resulted in 12 of the original 27 items being retained, six reflecting SCBI and six reflecting SCBO. An example of SCB-I is “Help teach safety procedures to new crew members”, and an example of SCBO is “Make suggestions to improve safety on-board”. Respondents were asked to rate the frequency with which they could be expected to perform the behaviours when needed using the same scale as for *in-role safety behaviour*. Three item parcels were created for each dimension of safety citizenship (SCBI and SCBO). The Cronbach’s alpha for the SCBI scale was 0.87 at Time I and 0.90 at Time II. For the scale SCBO, the alpha estimates were 0.88 at Time I and 0.90 at Time II.

Unsafe behaviour

The unsafe behaviour scale of Rundmo et al. (1998) is a measure of behaviours deemed risky in a variety of industrial settings, e.g. offshore and manufacturing. Mearns et al. (2001) validated the scale in an offshore context where employees work on-board offshore oilrigs, a context that has many parallels with shipping; for example, employees live and work in the same location, are away from family and friends for weeks at a time, and are at sea. The experts assessed which items were most relevant to a shipping context. Five items were retained from the original twelve, e.g. “I take chances to get the job done”. The experts also advised the inclusion of an additional item which has been implicated in a number of shipping accidents; namely, “I follow orders knowing them to be wrong”. Respondents rated the frequency with which they find themselves in the situations where they engage in the six behaviours listed on a range of 0 to 6 as above. Again, three item parcels were created that loaded onto the latent factor “unsafe behaviour”. Cronbach’s alpha was 0.82 at Time 1 and 0.84 at Time II.

Psychological well-being

Twelve items from Warr’s (1990) measure of psychological well-being at work were included to establish the psychological as well as the behavioural consequences of breach and fulfilment. This extensively researched measure of job-related affect asks respondents to indicate how frequently the job has made them feel a range of emotions over the preceding few weeks; for example, “uneasy” or “enthusiastic”. Individuals reported the frequency on a range from 0 (never) to 5 (all of the time). Scores were subsequently recoded to range from 1 to 6, in line with the original measure.

Warr’s original measure differentiates items into two dimensions of depression – enthusiasm (D-E) and anxiety – contentment (A-C) on the basis of the level of arousal underpinning the emotion. This factor structure combines items with positive as well as negative affective tone,

i.e. pleasant (relaxed) with unpleasant (uneasy). Using the data from the current sample, a series of factor analyses were conducted, which indicated that the items in this study factored along the lines of pleasantness and unpleasantness rather than arousal, but internal consistency estimates were low. Gloomy was subsequently dropped as item-total correlations indicated that this item was suppressing internal consistency estimates. The sixth item “Miserable” was deleted from the analyses, as data from less than two-thirds of the sample were available. This was due to a technical problem in the transmission of the Excel version of the questionnaire from shore to ship. Accordingly, a single scale of psychological well-being was constructed as has been done in previous research (O’Driscoll et al., 2011), but containing ten of the original twelve items. Items reflecting poor well-being (e.g. tense) were reverse-scored. Subsequently, the random allocation item parcelling approach used above was applied to form three item parcels.

Cronbach’s alpha for the resultant scale was $\alpha = 0.78$ at Time I and $\alpha = 0.82$ at Time II.

Health and safety outcomes

Unhealthy behaviour

Self-control failure is associated with individuals failing to resist temptation and break diets etc. as well as engage in risky behaviour (Baumeister et al., 1994). Accordingly, respondents were also asked to report the frequency and amount with which they engaged in a number of high-risk health behaviours such as smoking, alcohol consumption and exercise (reverse-scored). These items were adapted from the US Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance Survey (CDC, 2001). For example, individuals were asked to report the number of cigarettes they smoked per day, alcohol consumed (the number of days in the past month they consumed alcohol multiplied by the number of alcoholic drinks consumed), and the frequency with which they took at least 20 minutes of exercise per week.

To reduce the cognitive load, the respondents were presented with ranges, rather than asked to report actual amounts, e.g. “Tobacco consumption: How many cigarettes do you smoke per day?” Responses ranged from “None”, through 1-10, 11-20, 21-40, 41-60 to 60+. These ranges were recoded 0 for none to 5 for 60+. Adapting a procedure applied by O’Neill et al., (2009), the *Unhealthy behaviour* scale was constructed by summing the scores on the individual items. The minimum possible score was 0, indicating no tobacco or alcohol consumed and exercise taken more than three times a week. The maximum possible score was 30 to reflect 60+ cigarettes smoked, 10+ alcoholic drinks consumed on >21 days in a month and no exercise taken. At Time

I, the median was 5.00, the mean 5.52, and the *SD* 3.33. At Time II, the figures were 7.00, 7.52 and 3.42.

Accidents and near-misses

The measure used in this study was developed in the Norwegian & UK offshore industries (Mearns et al., 2001) and asks for respondents' accident histories based on reporting criteria used by the government regulator in both countries; for example, a serious injury is recorded if the individual was unable to work for more than 45 days. The measure was chosen as the reporting protocol is almost identical to that used in the UK and Danish shipping industries. Near misses are also included due to the problem of low base rates for individuals reporting accidents (cf. Zohar, 2000).

Respondents were asked to report the number of accidents where they had needed medical attention and near misses they had been involved in within the last two years while working for their current employer. Individuals with no history of accident were automatically directed to near miss questions. Individuals who reported an accident were also directed to the near-miss questions upon completion of those related to accidents. If individuals had been involved in an accident, they were then asked, "*When was the last time you had an accident where you needed medical attention?*" (Within 6 months, Within 1 year, More than 1 year); "*How many accidents have had in the last 2 years?*" (One, Two, Three, Four or more); and, "*Have you had an accident on-board this ship, or if not on-board, your last ship?*" (Yes, No).

In respect of near-misses, the respondents were asked, "*How many near-misses have you been involved in during the last 2 years?*" (None, One, Two, Three, Four or more); "*What might have been the worst probable outcome for the most severe near-miss that you have been involved in?*" (Fatality, Serious injury [>45 days off work], Lost time injury [3+ days off work], Medical treatment [minor], First aid injury [minor]); and, "*How many near misses have you been involved in on your current ship, or if not on-board, your last ship?*" (None, One, Two, Three, Four or more).

In Mearns et al.'s study, accident and near miss reports combined demonstrated significant relationships with safety behaviour and work pressure. Therefore, the same strategy was adopted. Individuals who had neither an accident nor a near miss scored 0; individuals with either an accident or a near miss, 1; two incidents, whether accidents, near-misses or a combination scored 2 and so on, with the final category of four or more accidents and / or near-misses scoring 8. At Time I the median = 1.00, mean = 1.56 and *SD* =1.76. For the second wave, these figures were 1.00, 1.65 and 1.83.

Self-regulatory focus at work

Self-regulatory focus at work describes how individuals respond to environmental stimuli regarding production and safety goals (Wallace, Johnson, & Frazier, 2009). Safety settings are often characterised by competing goals of production and safety (Janssens, Brett, & Smith, 1995) and Wallace and colleagues (Wallace & Chen, 2006) have demonstrated that individuals have motivational preferences in respect of the goal orientation they favour. The self-regulatory focus at work scale (RWS; Wallace et al., 2009) assesses individuals' *production regulatory focus* and *prevention regulatory focus* or the extent to which individuals are motivated by accomplishment and aspirations versus safety and responsibilities (Higgins, 1997, p. 1280).

This study asks individuals to report how often they focus on production versus safety goals at work using six items from the RWS, three production-focussed items² and three prevention-focussed items. For example, respondents are asked to rate on a scale of 0 (never) to 6 (always) how often they focus on "Accomplishing a lot at work" (production) and "Completing work tasks correctly" (prevention). The *production* scale's Cronbach alpha was 0.71 at Time I and 0.68 at Time II. The *prevention* scale's Cronbach alpha was 0.82 at Time I and 0.88 at Time II.

Emotion-regulation strategy

Eleven items were taken from Diefendorf et al.'s (2008) emotion regulation strategy survey (ERS). This survey draws on the process model of emotion regulation (Gross, 1998b) and asks individuals to report the frequencies with which they engage in five different strategies to manage negative affect: cognitive change, situation selection, response modulation, attentional deployment, and situation modification. The ERS was chosen over Gross and John's Emotion Regulation Questionnaire (Gross & John, 1998) because it expands the focus on strategies beyond reappraisal and suppression and explores their use as a consequence of affective events at work.

Three items from Nolen-Hoeksema & Morrow's (1991) Ruminative Response Scale (RSS) were included to assess individuals' propensity to engage in rumination as a response strategy. Rumination has been shown to exacerbate the effects of negative events on mood (Genet & Siemer, 2012) as well as maintain ego depleting levels of arousal (Bushman, 2002; Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005) and is not included in Diefendorf et al.'s ERS.

The number of items was chosen from each type of strategy on the basis of the strength of the relationship with psychological well-being as measured in Diefendorf et al.'s (2008) study, with

² Mean replacement was used for the third Production item as data from one-third of the sample were missing. This was due to a technical problem in the transmission of the Excel version of the questionnaire from shore to ship.

three items taken from the cognitive change strategy (e.g. “Thought about how the other person feels”) and three items from the RSS (e.g. “Thought about the situation over and over”). Two items were included from each remaining strategy; e.g. “Tried to solve the problem” is an example of response modulation. Respondents were asked to indicate how often they had used the strategies to manage their feelings and emotions in the last month from 0 (never) to 6 (always).

Given Diefendorf et al.’s scale had not been confirmed, partial confirmatory factor analyses were conducted to establish if the data were structured into five different strategies. The RSS items were also included in the analysis. Exploratory factor analysis (EFA) was performed on one-half of the data and confirmatory factor analyses (CFA) on the second half following a procedure described by Gignac, (2009). A six-factor model was inadmissible and while a three-factor model (reappraisal, suppression and rumination) had superior fit over a single ERS factor, $\chi^2_{(74)} = 438$; $\Delta\chi^2_{(3)} = 340$, $p < .01$, a two factor model provided the best fit for the data $\chi^2_{(53)} = 349$, $\Delta\chi^2_{(21)} = 89$, $p < .01$.

The first factor reflected antecedent-focused strategies, such as cognitive change, and the second factor contained response-focused strategies such as response modulation and the rumination items. Three item parcels per factor were constructed following trimming of the items to remove indicators that loaded < 0.32 on the factors. Two situation selection items and one response modulation item was removed. Cronbach’s alphas for the two scales were as follows: Antecedent-focussed ERS, $\alpha = 0.69$ at Time 1 and Time II; Response-focussed ERS $\alpha = 0.80$ at Time I and $\alpha = 0.82$ at Time II.

Control variables

Controls were entered into the cross-sectional analyses at Time I and Time II, measured as follows:

Contract type, dichotomised into 1 = “permanent” and 2 = “temporary contract”; education level, measured on a scale of 1 = “less than High School, to 9 = “Professional Degree”; experience, measured on a scale of 1 = “< 1 year” to 7 = “31+ years”; union membership, dichotomised into 1 = “yes” and 0 = “no”; and role, dummy coded into Manager, Officer and Rating with Manager as the reference category. Tenure, Time On-board, and Work: Leave Ratio were all included in the questionnaire but were dropped from subsequent analyses as they were highly correlated with role and experience.

5.3.4 Data analysis

The main purpose of this study was to test the model of psychological contracts and safety behaviour as presented in Figure 4.1, Chapter 4. First the model was tested cross-sectionally using Time I data. The model was then cross-validated using Time II data. These first two tests of the model were performed using structural equation modelling (SEM). Finally, the model was tested longitudinally through change score analyses (Finkel, 1995) using data from respondents who had completed the survey on both occasions. This last analysis evaluates the directional relationships between components of the model to establish whether changes in the Dependent Variable relate to changes in the Independent Variable.

SEM Analyses

Structural equation modelling (SEM) is a statistical methodology for confirming hypothesised structural (cause and effect) relationships between variables in non-experimental research (Bentler, 1988). It allows for the simultaneous evaluation of the relationships between the entire set of variables in the study, both those between underlying causal or latent processes and their indicators as well as those relationships between the hypothesised latent exogenous (independent) and endogenous (dependent) variables (Byrne, 2013). The former is known as the measurement model and the latter as the structural model (Ullman, 2013).

SEM employs multiple regression equations to evaluate the structural relations of unobserved variables known as factors rather than the observed variables. Unlike multiple regression, SEM can handle multiple DVs as well as multiple IVs (Ullman, 2013). Its other advantage over multiple regression is that it can model error in measurement; the extent to which relations between factors are degraded as a result of measurement error can be deduced. In multiple regression, measurement error in predictors is ignored (Byrne, 2013) and in the regression equation, error in dependent variables is aggregated thereby inflating its effect and reducing measurement precision (Stride, 2010). However, SEM is unable to establish proof of cause and effect relationships. SEM is a statistical technique that simply models the data gathered; it is the research design that determines whether the data contains causal relationships and thus if SEM can model those relationships (Tabachnik & Fidell, 2013).

To test the model cross-sectionally on both Time I and II data, a two-step strategy using AMOS 21 (Arbuckle, 2007) was adopted. This strategy, advocated by (Anderson & Gerbing, 1988) and described by Byrne (Byrne, 2013), assesses two conceptually distinct models. The first is known as the measurement model. This model specifies the relations between the observed or manifest variables, such as self-reported safety behaviours, and their underlying or latent constructs, such as safety citizenship. Unlike the structural model, relationships in the

measurement model are allowed to intercorrelate freely as its primary purpose is to establish convergent and discriminatory validity (Campbell & Fiske, 1959). In other words, are the instruments measuring what they purport to measure?

The second step is to specify the structural model; i.e. the causal relationships between the latent constructs. In this model, relationships between predictor (e.g. psychological contract breach) and dependent latent variables (e.g. unsafe behaviour) are constrained to behave in ways predicted by the focal theories (i.e. psychological contract theory). The structural model's purpose is to assess nomological validity; i.e. are the theoretical propositions upheld?

For the most part, this study employs a multiple-indicator approach wherein each construct is assessed by multiple items. According to Anderson and Gerbing (1988, p. 415), this is preferred over unidimensional measurement as it allows for "the most unambiguous assignment of meaning to constructs". However, given the problems associated with power when the variable to sample size ratio is less than 1:5 (Kline, 2005) item parcels for constructs were created following the partial disaggregation procedure outlined by Landis, Beal, & Tesluk (2000). Landis et al (2000) established that empirically equivalent or parallel indicators are more stable than other composites. Such parallel indicators have been used in safety studies (cf. Probst & Brubaker, 2001). They have the advantage of reducing parameters to be assessed in the model while at the same time maintaining measurement precision (Coffman & MacCallum, 2005).

Assessment of model fit

SEM establishes whether the structuring of the relations in the sample data is an accurate reflection of the researcher-specified model (Byrne, 2013). Assessment of model fit is a process of establishing the extent to which the sample data supports the hypothesised model. A series of indices have been developed and recommended by scholars (cf. Hu & Bentler, 1998); for example, chi-square (χ^2), Comparative Fit Index (Bentler, 1988), Root Mean Square Error of Approximation (RMSEA; (Browne, Cudeck, Bollen, & Long, 1993) and Standardised Root Mean Square Residual (SRMR; Bentler, 1995).

To assess the adequacy of the measurement and structural models where the model is complex and / or the sample size is small (≤ 250), Hu and Bentler (1998) recommend examining the following goodness-of-fit indices: CFI, RMSEA and SRMR. The cross-sectional models are complex and the longitudinal sample small and thus these criteria are used to assess model fit in the Time I, II and longitudinal samples reported below.

These three indices are reported as they assess model misspecification in different ways and thus should provide confidence that goodness-of-fit has been adequately and appropriately

assessed. In terms of cut-of criteria, researchers advise estimates close to 0.90 for the CFI, values between 0.05 and 0.08 for the RMSEA (Browne, Cudeck, Bollen, & Long, 1993) and values close to 0.08 for SRMR. All models were evaluated using Maximum Likelihood (ML) estimation method as the fit indices perform better using this technique (Tabachnik & Fidell, 2013).

Mediation analyses

The indirect effect of violation and cognitive failure on safety behaviours is assessed following the procedure outlined by Preacher and Hayes (2008). A joint significance testing approach is adopted as this outperforms other tests of mediating effects in terms of balancing Type I errors and statistical power (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The direct effect of the predictors on the mediators ($X \rightarrow M$) and the mediators' effect on the dependent variables ($M \rightarrow Y$) if jointly significant are taken to indicate a mediating or indirect effect is present.

Thereafter, the significance of the indirect effect is assessed using bias corrected, 95% confidence intervals. Where the upper and lower bounds include zero, the effect is taken to be non-significant. The parameter confidence intervals are established using 1,000 bootstrapped samples. Bootstrapping involves replicating the analysis on each random resampling of the population data (Tabachnik & Fidell, 2013) and provides for more accurate estimates of the indirect effect (Preacher & Hayes, 2008).

For the purposes of illustration, Zhao et al's (Zhao, Lynch, & Chen, 2010) model of mediation is replicated in Figure 5.2.

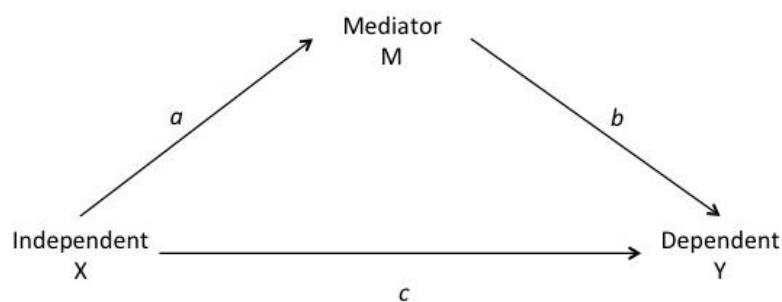


Figure 5.2 Diagram of the paths connecting an independent, mediator and dependent variable (adapted from Zhao et al, 2010)

Longitudinal analyses

The analysis of the longitudinal data applies a change-score approach (Finkel, 1995) and Structural Equation Modelling (AMOS 21; Arbuckle, 2007). The change-score approach enables

the amount of change in the dependent variable to be assessed as a function of the change in the predictor. In other words, baseline levels of both predictor and dependent variables are modelled and controlled for thereby establishing the extent to which change in the predictor is associated with change in the dependent variable; for example, does change in psychological contract fulfilment between Times I and II associate with change in frequency of in-role safety behaviour over the same period?

A change-score approach overcomes the limitations of simple time-lagged longitudinal analyses where the dependent variable at Time II is regressed onto the predictor variable at Time I. In these models, the extent of change cannot be assessed as the starting point for the independent and dependent variables is unknown (Pitariu & Ployhart, 2010).

The other advantage of the change-score approach is that it enables the dynamic effects of time to be assessed. Although there is little guidance in the literature regarding the speed or longevity of the effects of breach and fulfilment on outcomes (Conway & Briner, 2009), it is likely that the effect is neither static nor constant. Assessing the effects of breach and fulfilment on health and safety outcomes at two points in time enables the “shelf life” or duration of the effect to be determined (Pitariu & Ployhart, 2010, p. 411) albeit within the time lag of six months employed in this study. For example, if breach is associated with violation in cross-section, but lagged effects are not significant, then the effect of breach has diminished; people have forgotten that their employer reneged on its commitments six months earlier and are no longer upset. Notwithstanding the benefits of a panel design, given that only two waves of data collection occurred, it is not possible to establish the shape of the change, i.e. whether the change accelerates or decelerates over time (Pitariu & Ployhart, 2010). The diary study reported in Chapter 6 addresses this issue.

5.4 Results

Table 5.2 presents descriptive statistics and scale reliabilities. Table 5.3 presents interscale correlations for all study variables.

5.4.1 Assessment of normality

All data were screened prior to multivariate analyses to ensure they met assumptions of normality. The data were screened for (i) missing values; (ii) non-normal distributions; and, (iii) outliers, as will be explained below.

Missing data analysis

First, cases with missing values in more than 35% of variables were deleted (Tabachnik & Fidell, 2013). This reduced the sample by 31 at Time I from 750 to 719 and by 58 at Time II from 629 to 571. For the longitudinal sample, this reduced the sample by 2 from 101 to 99.

With the exception of variables where individuals were given the option to indicate, “no promise made”, and the two variables where data transmission problems had occurred, there were less than 5% of values missing amongst the manifest indicator variables. However, had listwise deletion been employed, the resultant sample would have been significantly reduced. Therefore, in order to preserve sample size and in accordance with guidance (Byrne, 2013) missing values were replaced using the expectation-maximization algorithm (EM) method (Dempster, Laird, & Rubin, 1977). This method is a computational device that estimates a missing value by first computing its expected value based on known values for all variables in the data set and then imputes a value based on maximum likelihood estimation (ML) procedures (Allison, 2003). Allison describes how the current values of variable *X* are used to compute a linear regression of *X* onto all the other variables in the data set. The missing values are then calculated using this regression equation. The process is reiterated until the EM replaced means and covariance matrix converge with the original without the missing values. Other methods, such as mean imputation, were rejected as they lack a theoretical basis and result in biased estimates (Byrne, 2013). Allison (2003, p. 564) asserts that conventional methods for handling missing values, such as listwise deletion, are inefficient in using the data and “[by] contrast, ML methods for handling missing data have nearly optimal statistical properties”. Missing values were thus accounted for and replaced using recommended analytical procedures that have been used in other empirical studies of organisational behaviour (cf. Olafsen, Niemiec, Halvari, Deci, & Williams, 2016).

Table 5.2
Summary statistics of measured variables

Construct	Scale range	No. items	Time I				Time II			
			N	M	SD	α	N	M	SD	α
Psychological contract fulfilment	1-5	35	746	3.10	0.55	.96	625	3.19	0.50	.97
Transactional		8	732	3.06	0.65		609	3.10	0.73	
Relational		13	724	3.10	0.66		602	3.17	0.74	
Employee safety interests		8 ^a	734	3.27	0.68		602	3.32	0.70	
Provision of safety resources		6 ^a	737	3.17	0.65		604	3.24	0.73	
Global breach	1-5	4 ^a	740	2.50	0.87	.74	599	2.49	0.86	.76
Self-regulation at work	0-6									
Production		3 ^a	636	4.01	1.48	.71	483	4.11	1.35	.68
Prevention		3 ^a	726	5.19	0.98	.82	577	5.09	1.17	.88
Psychological contract violation	1-5	4 ^a	738	1.98	0.82	.91	597	2.06	0.89	.91
Cognitive failure	1-5	11 ^a	737	2.02	0.86	.80	595	1.95	0.89	.84
Memory		3	740	1.91	0.86	.66	594	1.83	0.86	
Distraction		3	737	1.96	0.82	.64	594	1.90	0.86	
Blunders		3	737	2.09	0.87	.65	595	1.97	0.89	
Names		2	736	2.14	0.91	.67	596	2.08	0.93	
Emotion regulation strategies	0-6									
Antecedent focussed		6	734	3.73	1.48	.69	581	3.68	1.44	.69
Response focussed		6	733	2.47	1.48	.82	580	2.55	1.46	.82
In-role safety behaviour	0-6	12 ^a	728	5.20	1.06	.75	573	5.23	1.14	.75
Using PPE		3 ^a	728	5.53	0.81	.88	575	5.51	0.95	
Risk reduction practices		3 ^a	734	5.59	0.83	.83	575	5.89	0.87	
Communicating H&S info		3 ^a	723	5.37	0.91	.85	571	5.40	1.02	
Exercising rights & responsibility		3 ^a	725	4.30	1.70	.77	572	4.43	1.72	
Safety citizenship behaviour	0-6									
Individual		6 ^a	729	5.10	1.15	.87	572	5.15	1.18	.90
Organisation		6 ^a	724	4.68	1.33	.88	569	4.70	1.34	.90
Unsafe behaviour	0-6	6 ^a	724	0.84	1.13	.82	567	0.96	1.38	.84
Psychological well-being at work	0-5	10 ^a	718	4.38	1.16	.78	565	4.37	1.23	.82
Unhealthy behaviours	0-35	4 ^b	705	6.80	3.51	-	571	7.53	3.42	
Health outcomes	0-1	3 ^c	699	0.05	0.33	-	531	0.03	0.12	
Accidents	0-1	1 ^c	704	0.13	0.33	-	537	0.27	0.44	
Near misses	0-4	1	719	1.28	1.59	-	564	2.33	1.62	
Accident propensity	0-8	2 ^d	709	1.43	1.65	-	536	1.65	1.83	

Note. ^a Indicates abbreviated scale. ^b A composite scale measuring tobacco and alcohol consumption and exercise. ^c Health outcomes and accidents were scored such that if individuals reported a doctor diagnosed condition or had an accident, they scored 1 ^d A composite scale of accidents and near-misses in the last two years.

Table 5.3*Interscale correlations of study variables*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Fulfilment		-.36**	-.29**	-.04	.12**	.11**	.14**	.00	.28**	-.07	.10*	.07	.14**	.07	-.06	-.10*	-.10*	-.02
2 Breach	-.36**		.60**	.27**	-.19**	-.14**	-.16**	.24**	-.24**	.09*	.03	-.12**	-.02	.17**	-.01	.00	.00	.06
3 Violation	-.27**	.52**		.28**	-.16**	-.18**	-.16**	.32**	-.28**	.09*	-.03	-.24**	-.14**	.21**	-.09*	-.01	.00	.00
4 Cognitive failure	-.02	.08*	.15**		-.33**	-.22**	-.21**	.40**	-.28**	.21**	-.08	-.27**	-.02	.35**	.09*	.19**	.18**	.15**
5 IRSB	.12**	-.12**	-.17**	-.28**		.64**	.65**	-.32**	.27**	-.20**	.19**	.49**	.15**	-.13**	-.04	-.02	-.02	-.01
6 SCBI	.07	-.06	-.14**	-.23**	.64**		.70**	-.22**	.28**	-.11**	.22**	.48**	.28**	-.07	.09*	.12**	.10*	.06
7 SCBO	.08*	-.07	-.16**	-.21**	.66**	.70**		-.23**	.35**	-.17**	.23**	.43**	.24**	-.10*	.03	.09*	.07	.02
8 USB	-.05	.16**	.26**	.34**	-.35**	-.33**	-.35**		-.21**	.08*	.03	-.20**	.01	.29**	-.05	.08	.08	.03
9 PWB	.16**	-.18**	-.28**	-.37**	.29**	.24**	.31**	-.27**		-.15**	.19**	.24**	.25**	-.15**	-.03	-.03	-.03	-.02
10 UHB	-.03	.00	-.06	.07	-.10**	-.04	-.05	.04	-.08*		-.02	-.09*	-.03	-.10*	.08	.10*	.12**	.01
11 Production SRF	.05	.01	-.01	-.07	.21**	.19**	.17**	.01	.23**	-.05		.45**	.25**	.15**	.03	.07	.09*	-.00
12 Prevention SRF	.01	-.06	-.19**	-.26**	.46**	.39**	.33**	-.18*	.26**	.00	.38**		.31**	-.05	.05	.05	.04	.02
13 AERS	.07	-.06	-.06	.02	.21**	.18**	.15**	-.01	.22**	-.01	.31**	.28**		.35**	.01	.05	.02	.01
14 RERS	.10**	.10**	.14**	.32**	-.08*	-.09*	-.13**	.27**	-.21**	-.03	.19**	-.02	.37**		.04	.04	.04	.04
15 Accidents	-.06	.05	.08*	.09*	-.06	-.05	-.04	.10**	-.08*	.08*	.03	.01	-.02	-.01		.33**	.35**	-.07
16 Near-misses	.06	-.11**	-.02	.11**	-.02	.09*	.07	.08*	-.03	.14**	.06	.03	.01	-.02	.09*		.95**	-.01
17 Accident propensity	.05	-.09*	.01	.13**	-.04	.07	.05	.09*	-.04	.14**	.05	-.00	-.01	-.02	.23**	.96**		-.01
18 Health outcomes	.00	-.04	-.02	.10*	.01	-.03	-.07	-.01	-.10*	.01	.04	-.02	-.04	.02	.06	.02	.02	

Note. Time I correlations are presented below the diagonal ($N = 719$). Time II correlations are presented above the diagonal ($N = 571$). IRSB = In-role Safety Behaviour. SCBI = Safety Citizenship Behaviour – Individuals. SCBO = Safety Citizenship Behaviour – Organisation. USB = Unsafe Behaviour. PWB = Psychological Well-being. UHB = Unhealthy Behaviour. SRF = Self-regulatory Focus. AERS = Antecedent-focussed Emotion Regulation. RERS = Response-focussed Emotion Regulation.

Distributions

Histograms of all univariate variables were inspected to establish the shape of the distribution. Kurtosis is particularly problematic for SEM (Byrne, 2013). Several of the items in the fulfilment latent factor were kurtotic, with the majority of respondents indicating that their employer met its obligations (3 on the 5-point scale). Skewed distributions were also apparent in all the safety behaviour items with many respondents indicating that they, “very frequently”, or, “always” performed the pro-safe behaviours, and “never” or “rarely” performed the unsafe behaviours. Transformation of the variables was considered but rejected as interpretation becomes more difficult and the results harder to explain (Tabachnik & Fidell, 2013, p. 83).

Outliers

Box and whisker plots indicated that several variables had outliers. Adopting Hoaglin and colleagues’ (Hoaglin & Iglewicz, 1987; Hoaglin, Iglewicz, & Tukey, 1986) outlier labelling rule, outliers were identified by multiplying the interquartile range by 2.2 to estimate the upper and lower bands of the normal distribution. Outlying values were transformed to the appropriate boundary and returned to the sample of scores for further analyses.

5.4.2 Measurement models

This section continues with the results of the assessment of the entire eighteen-factor model and reports its construct validity at Time I and Time II. This assessment also includes a review of convergent and discriminant validity of the constructs using the Average Variance Extracted (AVE) method (Fornell & Larcker, 1981) as well as a test of invariance of the measurement model across the two samples using the multigroup analysis process in AMOS 21 (Byrne, 2013). Second, this section provides the results of the structural modelling procedures and parameter estimates for the hypothesised structural relations.

Appendix A presents the measurement model confirmatory factor loadings for the item parcels and the average variance explained (AVE). Table 5.4 displays goodness-of-fit statistics obtained for the measurement models at Time I and Time II.

Time I measurement models

Confirmatory factor analyses were computed to establish the fit of the eighteen-factor, full model to the data and a more parsimonious thirteen-factor model. The full model contains the three dimensions of transactional, relational and safety psychological contract fulfilment and the four dimensions of in-role safety behaviour as separate factors. The alternative model

collapses these facets into one composite factor of psychological contract fulfilment (PCF) and one composite of in-role safety behaviour (IRSB).

An assessment of convergent and discriminant validity of both the full and alternative measurement models demonstrated that the latter, more parsimonious model had much improved convergent and discriminant validity. In this model, all but three factors (Breach = .42, Production Self-Regulatory Focus = .46, Antecedent-focused Emotion Regulation = .44) exceeded the threshold criterion of AVE > .50 (Fornell & Larcker, 1981) and there were no discriminant validity issues wherein the AVE is less than the variance shared (i.e. the squared correlation) with other factors. The variance shared between pairs of factors ranged from .01 to .59.

In the full model, six factors failed to meet the AVE > .50 criterion and there were fourteen discriminant validity issues. The facets of PCF and IRSB demonstrated better discriminant validity when collapsed into single factors than as separate constructs. Consequently, and although the full model had minimally improved goodness-of-fit metrics over the alternative model, the latter more parsimonious measurement model $\chi^2_{(782)} = 2066$, is taken forward into the structural model. The alternative model was improved by allowing error terms in breach and IRSB to covary, resulting in a much-reduced χ^2 ($\chi^2_{(780)} = 1806$, $\Delta\chi^2_{[2]} = 260$, $p < .01$). Similarity of wording in the items is the likely cause of this error variance. This last model also provided a good fit on the basis of indices recommended by Hu and Bentler (1998), with the comparative fit index (CFI) = .926, root mean square error of approximation (RMSEA) = .043 and standardized root mean square residual (SRMR) = .0453. All factor loadings were statistically significant beyond the .01 level.

The measurement model was tested for common method bias (CMB) by computing the difference between standardised regression weights with and without the inclusion of a common method factor (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). No differences in regression weights exceeded 0.20 and the average difference in weight was <0.04. On the basis of Goodness of Fit indices, the χ^2 was significantly less with the inclusion of a Common Method Factor. However, the more appropriate Δ CFI test (for large sample sizes) failed to reach the threshold of 0.1 advocated by Cheung and Rensvold (2002). Thus, CMB is deemed unproblematic in this study. Taken together these results suggest a good fit of the measurement model to the data.

Table 5.4
Goodness-of-fit Indices for measurement and structural models

Model	<i>N</i>	χ^2	<i>df</i>	CFI	RMSEA	SRMR
Measurement models						
Time I						
Full measurement	719	2567	1022	.923	.046	.0457
Alternative measurement	719	2066	782	.920	.048	.0457
Nested model (2 error covariances)	719	1806	780	.936	.043	.0453
Time II						
Alternative measurement	571	2254	782	.900	.057	.0582
Nested model (2 error covariances)	571	1808	780	.930	.048	.0560
Multigroup						
Unconstrained measurement	1290	3739	1562	.929	.033	.0457
Fully constrained	1290	3891	1592	.925		
Multigroup one factor model						
Without CMF	1290	3665	1560	.932		
With CMF	1290	3094	1474	.947		
Structural models						
Time I						
Model A Full mediation	719	2273	649	.874	.059	.0815
Model B Partial mediation	719	1838	674	.916	.049	.0444
Nested I	719	1555	658	.935	.044	.0422
Time II						
Model A Full mediation	571	2283	625	.855	.068	.1047
Model B Partial mediation	571	1832	648	.906	.057	.0547
Nested I	571	1493	632	.932	.049	.0533
Multigroup (Time I and Time II)						
Unconstrained	1290	2456	978	.939	.034	.0461
Fully constrained	1290	2629	1023	.934		

Notes. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; CMF = Common Method Factor

Model A = the hypothesised model that allows full mediation of PCF and Breach via Violation and Cognitive Failure.

Model B = an alternative model that allows for partial mediation of Breach and Fulfilment on outcomes.

Nested I allows the disturbance terms for IRSB, SCBI SCBO USB and UHB to covary.

For the Time II sample, the role of "Manager" was omitted, as the matrix became non-positive definitive.

Invariance testing of measurement models from Time I and Time II

Given that the two waves of the survey were sampled from the same population, the opportunity existed to test for invariance of the measurement and structural models across the two samples. Comparative testing was conducted according to the two-step procedure outlined by Byrne (2004, 2013). First, using the Time I model as the calibration model, model fit is computed for the multigroup sample; i.e. both Time I and Time II combined. Second, a fully constrained model, wherein all paths are set to be equal between Sample 1 and Sample 2, is

compared against a totally unconstrained model wherein all paths are free to vary. This test establishes if factor loadings are equivalent across samples. The χ^2 difference test ($\Delta\chi^2$) is applied to establish if the two samples are significantly different. However, given this test is overly sensitive to sample size, a more practical and “superior” test of invariance is also applied; namely the CFI difference test (ΔCFI ; (Cheung & Rensvold, 2002, p. 18). The final assessment of invariance is to apply the $\Delta\chi^2$ test. If the $\Delta\chi^2$ test is statistically significant and ΔCFI is greater than .01, then the assumption of invariance is rejected and factor-loading invariance is assessed on a factor-by-factor basis to establish where the conceptual disagreement between the two samples lies.

The multigroup model, wherein the data from both samples are combined, yielded fit statistics that indicated satisfactory model fit $\chi^2_{(1290)} = 3739$; TLI = .918; RMSEA = .033; SRMR = .0457. This served as the baseline model for invariance assessment.

Second, a fully constrained model was compared to the unconstrained model; i.e. factor loadings constrained to be equal across samples, versus free to vary. The constrained model ($\chi^2_{(1290)} = 3891$, CFI = .925) had significantly worse fit on the χ^2 difference test ($\Delta\chi^2_{[30]} = 152$, $p < .01$), but it did not exceed the cut off on the CFI difference test ($\Delta\text{CFI} = .004$). Thus, it appears that for practical purposes the measurement model is invariant across the two samples; item and parcel loadings on the factors may vary, but this variance is not dramatic enough to be of concern. Furthermore, variation is to be expected between samples (Byrne, 2013).

The next stage of the analysis was the structural modelling procedure. Parameters in the model were either fixed at 0; i.e. there were no hypothesised relations, or estimated according to the proposed theoretical structure presented in Figure 4.1. Rather than lose cases to attritional missing data on demographic variables (e.g. age) and health and safety outcomes (e.g. accident involvement), missing values were replaced by the modal categories for each sample.

5.4.3 Structural models

The goodness-of-fit statistics for the proposed and alternative structural models are presented in Table 5.4.

Time I structural models

Structural model fit was tested via the estimation of the hypothesised full mediation model (Model A) using the full sample ($N = 719$). The hypothesised model represented a marginal fit to the data $\chi^2_{(649)} = 2273$, CFI = .874; RMSEA = .059; SRMR = .0815 indicating that the structural relations between constructs might differ from that proposed.

An alternative model (Model B) allowed partial mediation of fulfilment and breach on outcomes and reduced model misfit considerably $\chi^2_{(674)} = 1838$, $\Delta\chi^2_{(25)} = 435$, $p < .001$. Given the expectation that outcomes would be intercorrelated; for example, the dimensions of safety citizenship (cf. N. Turner et al., 2005), and, given that the interrelationships amongst outcomes was not of prime interest, a nested version of the alternative model that modelled the intercorrelations was tested and found to further reduce model misfit. This nested model (B I) yielded stronger fit to the data than the initial Model B, $\chi^2_{(658)} = 1555$, $\Delta\chi^2_{(16)} = 283$, $p < .01$; CFI = .935; RMSEA = .044; SRMR = .0422. Model B I is depicted in Figure 5.3. Please note that direct relationships between controls and outcomes and between fulfilment, breach and outcomes are modelled, but for the sake of clarity, are not shown in Figure 5.3.

The estimation of the effects of the moderators of self-regulatory focus at work and emotion regulation is tested separately. The structural models are reported alongside the results in the section below.

Invariance testing of structural models from Time I and Time II

As with the measurement models, the opportunity existed to test the invariance of the structural relations. Using the multigroup and automatic model comparison features in AMOS 21, the Time I structural model was used as the calibration model and the Time II data used to validate the model. Figure 5.4 depicts the results of parameter estimates at Time II.

As with the procedure for assessing the measurement model, first model fit was assessed for the combined samples on an unconstrained model. Subsequently, change in model fit for a fully constrained model was assessed using $\Delta\chi^2$ and Δ CFI difference tests. The unconstrained multigroup model demonstrated good model fit $\chi^2_{(978)} = 2456$, CFI = .939; RMSEA = .034; SRMR = .0461. When constrained, the model fit dropped. Applying the χ^2 difference test, this degradation in model fit was significant $\chi^2_{(1023)} = 2629$, $\Delta\chi^2_{(45)} = 173$, $p < .01$. However, when applying the CFI test, the difference failed to exceed the Δ CFI > .01 criterion (Δ CFI = .005).

5.4.4 Cross-sectional results

Results are now reported according to the research questions and associated hypotheses.

RQ1 What is the relationship of fulfilment and breach with health and safety behaviour?

Results of structural model assessment indicate a partial mediation model is a better fit to the data than a full mediation model, signifying that fulfilment and breach have direct as well as mediated relationships with outcomes. Table 5.5 indicates the standardised parameter

estimates for the direct and total relationships of breach and fulfilment with outcomes controlling for education, experience, contract, role and union membership. Indirect effects are reported below under the research questions in respect of mediation.

Hypothesis 1 (H1a) in which fulfilment is expected to positively relate and breach is expected to negatively relate to outcomes (psychological well-being, safety compliance, safety citizenship behaviour towards colleagues and the organisation), is partially supported. The total effect of fulfilment is positively associated with psychological well-being (PWB; $\beta_{Total\ T1} = .12, p < .01$; $\beta_{Total\ TII} = .26, p < .01$), safety citizenship towards colleagues (SCBI; $\beta_{Total\ T1} = .10, p < .05$; $\beta_{Total\ TII} = .10, p < .05$), but only for the second sample in respect of in-role safety behaviour (IRSB $\beta_{Total\ TII} = .10, p < .05$) and safety citizenship behaviour towards the organisation (SCBO; $\beta_{Total\ TII} = .14, p < .05$). Comparing the size and significance of the parameter estimates of total and direct effects, these findings arise predominantly from the direct effect of fulfilment on outcomes.

In respect of breach, the total effects are negatively related to psychological well-being for both samples (PWB; $\beta_{Total\ T1} = -.17, p < .05$; $\beta_{Total\ TII} = -.17, p < .01$), and for the second sample only, in-role safety behaviour (IRSB $\beta_{Total\ TII} = -.10, p < .05$) and safety citizenship towards colleagues (SCBI $\beta_{Total\ TII} = -.10, p < .05$). Comparing the size and significance of the total and direct effects, these findings arise almost exclusively from the contribution of the indirect effects of breach on outcomes. Contradictorily, breach has a positive as opposed to negative direct relationship with safety citizenship towards the organisation, although the total effect is non-significant.

According to H1b predictions, fulfilment ought to have a negative and breach a positive relationship with unsafe and unhealthy behaviours. Fulfilment has a positive direct relationship with unsafe behaviour for the Time II sample only (USB $\beta_{Direct\ TII} = .10, p < .05$) although the total effect is non-significant. In respect of breach, the total effect is significant and positively related to unsafe behaviour in both samples (USB $\beta_{Total\ T1} = .19, p < .01$; $\beta_{Total\ TII} = .33, p < .01$). Therefore, Hypothesis 1b is also partially supported.

These results suggest that perceptions of fulfilment are reliably related to psychological well-being and safety citizenship behaviours directed towards colleagues. This supports the proposition that a functioning psychological contract operates in a safety setting in a comparable manner to other employment contexts. Individuals appear to flourish and expand their prosocial role behaviours when their employer meets its obligations.

Table 5.5*Direct and total effects of fulfilment and breach at Time I and Time II (standardised path estimates).*

Predictor	Criterion	Time I	Time II
		β	β
Direct effects			
Fulfilment	PWB	.11**	.23**
	IRSB	.06	.09
	SCBI	.08*	.08
	SCBO	.06	.12*
	USB	.02	.10*
	UHB	-.04	-.05
Breach	PWB	-.02	.07
	IRSB	.10	.12
	SCBI	.10	.10
	SCBO	.12*	.12
	USB	.02	.05
	UHB	.08	-.05
Total effects (direct and indirect combined)			
Fulfilment	PWB	.12**	.26**
	IRSB	.07	.10*
	SCBI	.10*	.10*
	SCBO	.08	.14**
	USB	.00	.08
	UHB	-.03	-.05
Breach	CF	.12*	.23**
	PWB	-.17*	-.17**
	IRSB	-.06	-.10*
	SCBI	-.03	-.10*
	SCBO	-.03	-.07
	USB	.19**	.33**
	UHB	.03	.05

Notes. $N = 719$ (TI) $N = 571$ (TII). PWB = Psychological well-being. IRSB = In-role Safety Behaviour. SCBI = Safety Citizenship – Individual. SCBO = Safety Citizenship – Organization. USB = Unsafe behaviour. UHB = Unhealthy behaviour. CF = Cognitive Failure. * $p < .05$; ** $p < .01$; *** $p < .001$. Direct effects from controls to outcomes are modelled but are not shown.

However, in respect of breach, and as posited, individuals do not appear to engage in withdrawal in direct response to breach perceptions as such withdrawal is illogical. It is only when the effects of violation and cognitive failure are added does breach relate reliably to poorer psychological well-being, the withdrawal of in-role safety behaviour, the withdrawal of safety citizenship towards colleagues, and to more unsafe behaviour.

RQ2a. What is the relationship of fulfilment and breach with violation?

Hypotheses 2 and 3 predicted that fulfilment would relate negatively and breach positively to violation. These hypotheses were tested via estimation of the partial mediation model. Figures

5.3 and 5.4 below (pp. 150 – 151) depict direct effects of fulfilment and breach on violation and violation's effects on outcomes while controlling for education, experience, contract, role and union membership as well as cognitive failure.

In line with predictions (H2 and H3), fulfilment associates negatively with the experience of violation ($\beta_{Time I} = -.10, p < .01$; $\beta_{Time II} = -.15, p < .01$), and breach associates positively with the experience of violation ($\beta_{Time I} = .62, p < .01$; $\beta_{Time II} = .69, p < .01$). It is worth noting the substantial difference in the size of the effect. Breach's relationship is much stronger than fulfilment's thereby lending support to the call to differentiate the two constructs.

RQ2b. What is the relationship of fulfilment and breach with cognitive failure?

Hypotheses 4 and 5 were tested via estimation of the partial mediation model presented above.

Hypothesis 4 predicted that fulfilment would relate negatively to and H5 that breach would relate positively to cognitive failures. Hypothesis 4 is not supported whereas H5 is partially supported. Fulfilment is not related to a reduced prevalence of cognitive failure. On the other hand, higher levels of breach are associated with higher levels of cognitive failure. However, when violation is controlled for; i.e. a path is drawn from violation to cognitive failure, the direct effect of breach on cognitive failure is only significant for the second sample ($\beta_{Time I} = .01, p > .05$; $\beta_{Time II} = .23, p < .01$). Nevertheless, the estimates of the total effect of breach on cognitive failure; i.e. when the indirect effect via violation is included with the direct effect (Table 5.5), are significant at both time points ($\beta_{Total TI} = .12, p < .05$; $\beta_{Total TII} = .23, p < .01$) indicating that breach does have a significant relationship with attentional deficits.

RQ2c. What is the relationship of violation with cognitive failure?

Hypothesis 6 is supported. Individuals who experience greater amounts of violation also report more prevalent cognitive failures. This effect persists when the direct path between breach and cognitive failure is present ($\beta_{Time I} = .19, p < .05$; $\beta_{Time II} = .16, p < .05$).

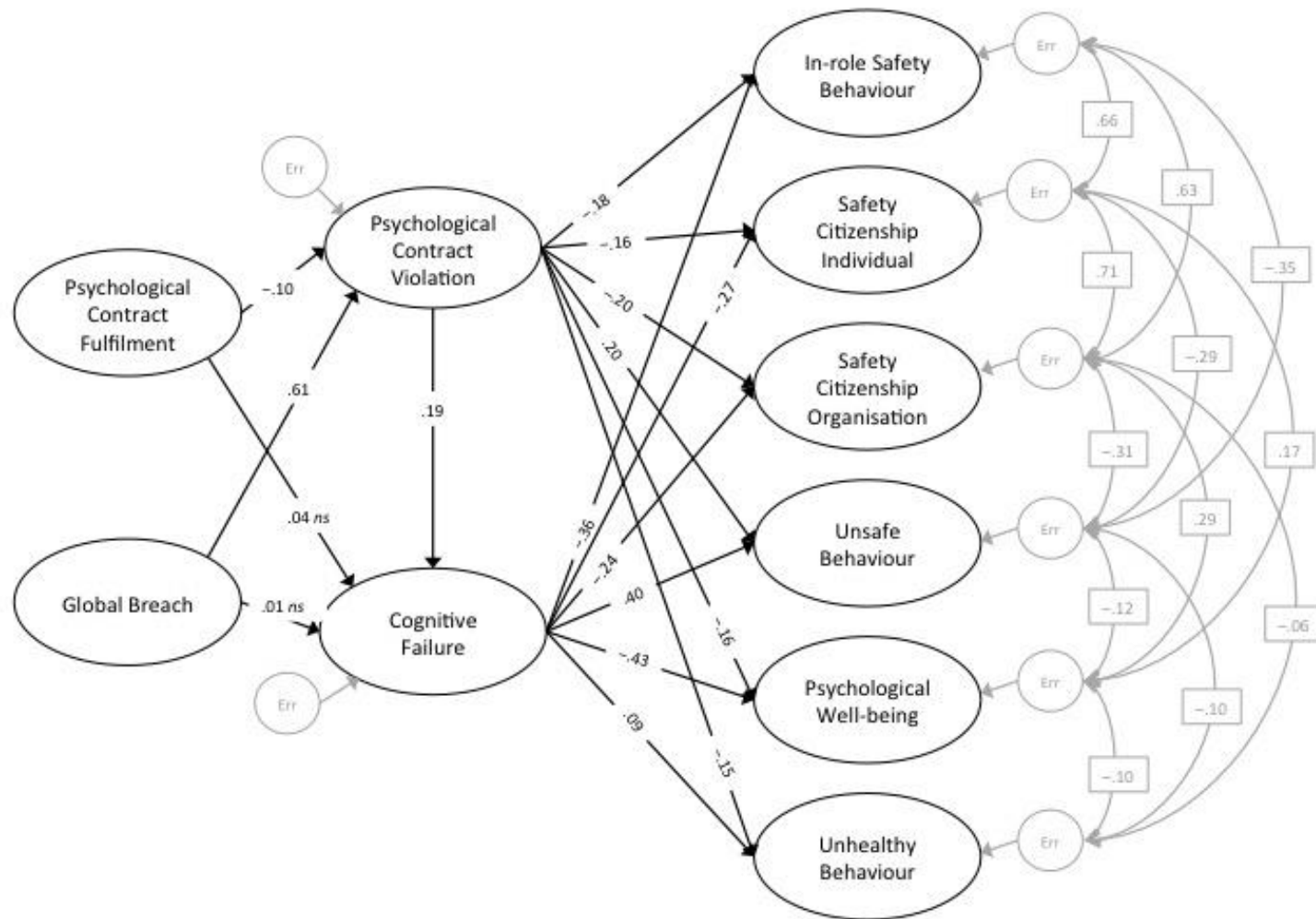


Figure 5.3 Model B I: The partially-mediated effects of psychological contract fulfilment and breach on outcomes at Time I.

Notes. $N = 719$. Coefficients $> .09$ are significant at the $p < .05$ level unless indicated; coefficients $> .20$ are significant at the $p < .01$ level. Direct effects from fulfilment, breach and controls to outcomes are modelled but are not shown.

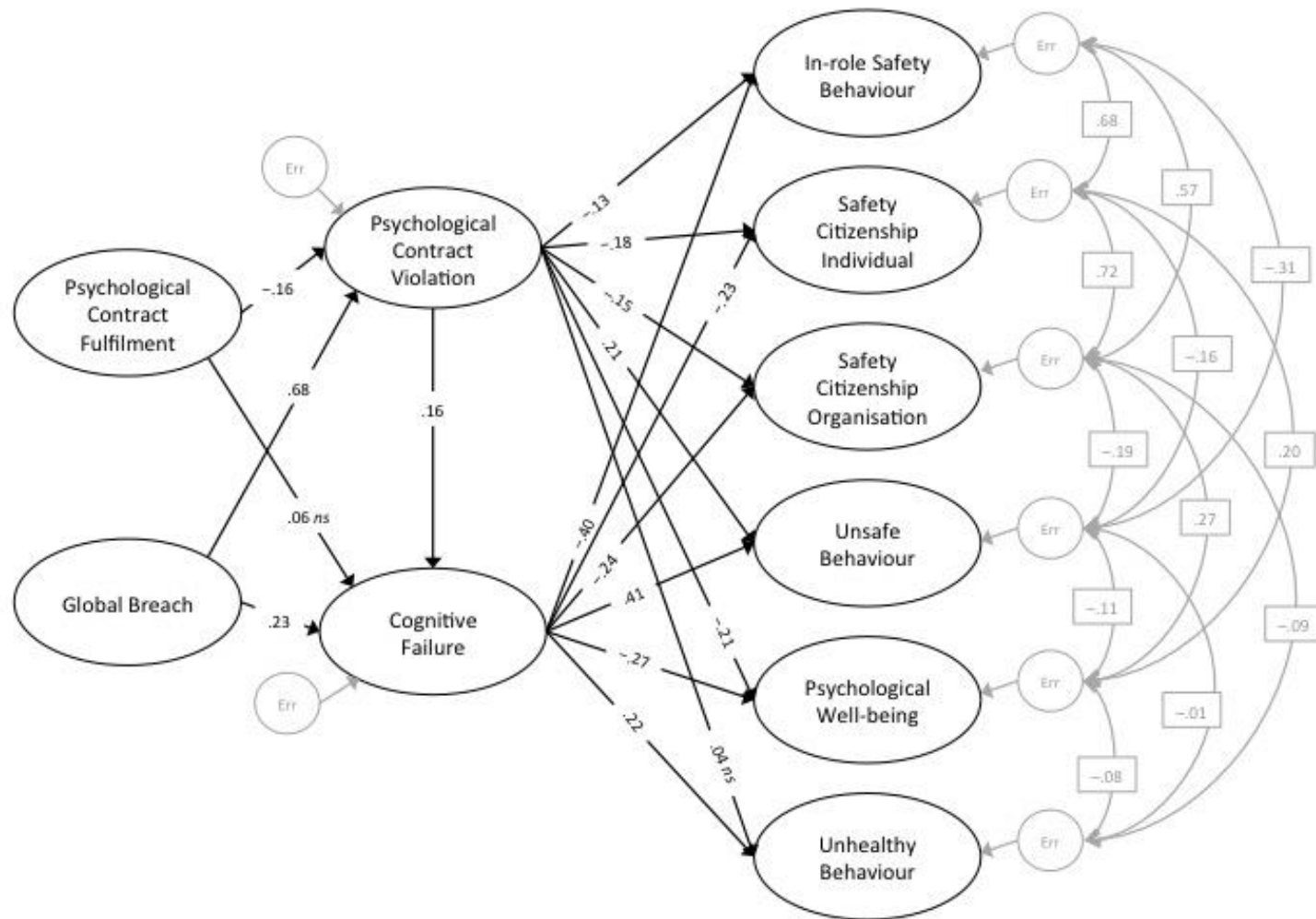


Figure 5.4. Model B I: The partially-mediated effects of psychological contract fulfilment and breach on outcomes at Time II.
Notes. $N = 571$. Coefficients $> .10$ are significant at the $p < .05$ level; coefficients $> .20$ are significant at the $p < .01$ level. Direct effects from fulfilment, breach and controls to outcomes are modelled but are not shown.

RQ3a. To what extent does violation mediate the relationship of fulfilment and breach with health and safety behaviour?

In order to establish that an indirect effect ($a \times b$) is present, both the path from predictor to mediator (a) and from the mediator to the outcome (b) needs to be significant (MacKinnon et al., 2002). Using the full samples and Bias Corrected Percentile Bootstrapping (Hayes & Preacher, 2014), each mediation path was tested while controlling for the other mediation path. Direct effects are presented in Figures 5.3 and 5.4. Standardised regression coefficients for the indirect effects via violation are presented in Table 5.6. Given the joint significance of the relationship of fulfilment and breach with violation and violation's significant relationship with all the safety behaviours, the indirect effects of fulfilment and breach are assessed below. In order to isolate the effects on outcomes of the violation mediation path, the paths from fulfilment and breach to cognitive failure are deleted in turn. Thus, the indirect effect statistic reported is the effect of fulfilment or breach on outcomes via violation *only* while controlling for the effect of cognitive failure on health and safety outcomes. This procedure was also adopted at Time II.

Hypotheses 7 and 8 predicted that violation would mediate fulfilment's positive effects on health and safety behaviours (H7) and its negative effects on unsafe and unhealthy behaviour (H8). Hypotheses 9 and 10 maintained that violation would mediate the negative relationship of breach with psychological well-being, in-role safety behaviour (IRSB) safety citizenship towards colleagues (SCBI) and the organisation (SCBO). Violation was also predicted to mediate the positive relationship of breach with unsafe behaviour and unhealthy behaviours (UHB). With the exception of unhealthy behaviour, these hypotheses are supported.

Figure 5.3 above show that at Time I, violation negatively predicts individuals' experience of psychological well-being (PWB, $\beta_{Time I} = -.19, p < .05$), negatively predicts the frequency with which individuals engage in pro-safe behaviours (IRSB, $\beta_{Time I} = -.20, p < .01$; SCBI, $\beta_{Time I} = -.17, p < .01$; and SCBO, $\beta_{Time I} = -.21, p < .01$), and positively predicts their unsafe behaviour (USB, $\beta_{Time I} = .22, p < .0$). The effect sizes are of the same magnitude and in the same direction at Time II (Figure 5.4).

Referring to Table 5.6 overleaf, the sign of the indirect effects for fulfilment remained positive in respect of well-being (PWB $\beta_{Indirect T I} = .02, p < .05$); pro-safe behaviour (IRSB, SCBI, SCBO $\beta_{Indirect T I} = .02, p < .05$); and, negative for unsafe behaviour (USB $\beta_{Indirect T I} = -.02, p < .05$). The effects were replicated at Time II. Fulfilment continued to act as a motivational force for individuals' safety contributions in the presence of violation.

The sign of the indirect effect for breach remained negative for well-being (PWB $\beta_{Indirect\ T I} = -.11$, $p < .01$); pro-safe behaviour (IRSB, $\beta_{Indirect\ T I} = -.12$, $p < .01$; SCBI $\beta_{Indirect\ T I} = -.11$, $p < .01$; SCBO $\beta_{Indirect\ T I} = -.13$, $p < .01$); and positive for unsafe behaviour (USB $\beta_{Indirect\ T I} = .13$, $p < .01$).

Individuals who experienced violation as a consequence of breach were motivated to withdraw their safety behaviour and engage in counterproductive behaviour. The effects were replicated at Time II.

Table 5.6

Motivation mediation pathway: indirect path estimates (bootstrapped) with 95% confidence intervals of fulfilment and breach on health and safety behaviours via violation

Factor and statistic	Time I			Time II			
	β (SE bootstrap)	LLCI	ULCI	β (SE bootstrap)	LLCI	ULCI	
<i>Indirect through violation</i>							
Fulfilment	IRSB	.02 (01)*	.001	.052	.02 (01)*	.002	.049
	SCBI	.02 (01)*	.001	.044	.03 (01)**	.007	.062
	SCBO	.02 (01)*	.002	.050	.03 (01)*	.004	.055
	PWB	.02 (01)*	.001	.051	.03 (02)**	.001	.070
	USB	-.02 (01)*	-.060	-.002	-.04 (02)**	-.071	-.011
	UHB	.02 (01)*	.002	.043	-.01 (01)	-.032	.014
	Breach	IRSB	-.12 (04)**	-.210	-.047	-.09 (05)*	-.196
SCBI		-.11 (04)**	-.205	-.040	-.12 (05)*	-.230	-.033
SCBO		-.13 (04)**	-.211	-.058	-.11 (05)*	-.198	-.015
PWB		-.11 (04)**	-.189	-.033	-.15 (05)**	-.257	-.049
USB		.13 (04)**	.054	.224	.16 (05)**	.065	.264
UHB		-.09 (04)**	-.176	-.032	.03 (05)	-.068	.124

Notes. Time I $N = 719$. Time II $N = 571$. LLCI = Lower level confidence interval; ULCI = Upper level confidence interval. IRSB = In-role Safety Behaviour. SCBI = Safety Citizenship – Individual. SCBO = Safety Citizenship – Organization. PWB = Psychological well-being. USB = Unsafe behaviour. UHB = Unhealthy behaviour. * $p < .05$; ** $p < .01$.

Contrary to expectations, the effect sizes were not consistently greater for the citizenship behaviours and organisationally relevant citizenship behaviour was not the most likely behaviour to be withdrawn. Furthermore, and despite the sanctions that might be associated with unsafe behaviour, the effect size for unsafe behaviour was as large as the largest effect size for safe behaviour, suggesting that violation is motivating individuals to take shortcuts and break safety rules. Thus, psychological contract evaluations have important consequences for affect and these have important implications for individuals' safety contributions and mental health.

In terms of the hypotheses, H7 and H9 are fully supported and H8 and H10 are supported for unsafe behaviour. Violation mediates the positive relationship of fulfilment (H7) and the negative relationship of breach (H9) with well-being and prosocial behaviours. Violation also

mediates the negative relationship of fulfilment (H8) and the positive relationship of breach (H10) with unsafe behaviour for both samples and unhealthy behaviour for the first sample.

RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with health and safety behaviour?

As with the motivation mediation pathway, the direct paths from fulfilment and breach to cognitive failure (path *a*) and from cognitive failure to outcomes (path *b*) were first assessed to establish if there was evidence of an indirect path (*a x b*). Results of this joint significance testing indicate that there is evidence of an indirect path via cognitive failure for breach but not for fulfilment on account of the non-significant relationship of fulfilment with cognitive failure in both samples (see Figures 5.3 and 5.4). Cognitive failure does not appear to mediate the effects of fulfilment on safe, unsafe and unhealthy behaviour and thus Hypotheses 11 and 12 are unsupported.

It is also important to note that for the Time I sample, breach only predicted cognitive failure when violation was uncontrolled. Therefore, given the joint significance of breach to violation and violation to cognitive failure, the indirect effects of breach on cognitive failure via violation are also reported.

Hypotheses 13 and 14 stated that an individual's cognitive failure would be negatively affected by experiencing breach and this would in turn affect their psychological well-being and capacity to make a safety contribution resulting in the withdrawal of pro-safe behaviours (H13) and the increase in unsafe and unhealthy behaviour (H14).

Figures 5.3 and 5.4 above show that at Time I, cognitive failure negatively relates to individuals' psychological well-being (PWB, $\beta_{Time I} = -.43, p < .05$), the frequency with which individuals engage in pro-safe behaviours (IRSB, $\beta_{Time I} = -.37, p < .01$; SCBI, $\beta_{Time I} = -.28, p < .01$; and SCBO, $\beta_{Time I} = -.25, p < .01$), and positively associates with their unsafe (USB, $\beta_{Time I} = .41, p < .01$) and unhealthy behaviour (UHB, $\beta_{Time I} = .09, p < .01$). The effect sizes are of the same magnitude and in the same direction at Time II for all outcomes except unhealthy behaviour. In the Time II sample, the relationship is stronger (UHB $\beta_{Time II} = .22, p < .01$).

Table 5.9 overleaf presents indirect bootstrapped effects of breach on safe and unsafe behaviour via cognitive failure and via the serial mediation of breach via violation and cognitive failure. This table demonstrates that cognitive failure mediates the negative relationship of breach with all outcomes, supporting hypotheses H13 and H14. Referring to the indirect effect of breach, removing the path of violation to cognitive failure, the strongest mediating effects of cognitive failure are for psychological well-being (PWB $\beta_{Indirect T1} = -.05, p < .05$), in-role safety behaviour

(IRSB $\beta_{Indirect\ T1} = -.05, p < .05$) and unsafe behaviour (USB $\beta_{Indirect\ T1} = .05, p < .05$). If Hockey's (1993) arguments regarding primary role behaviours and compensatory costs were true, individuals would preserve in-role behaviours (IRSB) and forego discretionary behaviours (SCBI and SCBO) rather than the other way round. Thus it would appear that the attentional pull of the task (how interesting it is; Beal et al., 2005), rather than the motivational pull of the task (the extent to which it is sanctioned by management) would appear to be more important in predicting which behaviours are withdrawn in the face of breach via cognitive failure.

Table 5.7

Attention mediation pathway: indirect path estimates (bootstrapped) with 95% confidence intervals for health and safety behaviours via cognitive failure.

Factor and statistic	Time I			Time II			
	β (SE bootstrap)	LLCI	ULCI	β (SE bootstrap)	LLCI	ULCI	
<i>Indirect through cognitive failure</i>							
Breach	IRSB	-.04 (02)*	-.094	-.005	-.14 (03)**	-.205	-.095
	SCBI	-.03 (02)*	-.072	-.004	-.08 (02)**	-.137	-.053
	SCBO	-.03 (02)*	-.066	-.005	-.08 (02)**	-.136	-.048
	PWB	-.05 (03)*	-.010	-.004	-.09 (02)**	-.143	-.070
	USB	.05 (02)*	.004	.099	.14 (03)**	.090	.213
	UHB	.01 (01)*	.001	.030	.08 (02)**	.041	.126
<i>Indirect through violation</i>							
Breach	Cognitive failure	.12 (04)**	.054	.193	.23 (05)**	.146	.322
<i>Indirect through violation and cognitive failure</i>							
Breach	IRSB	-.15 (04)**	-.240	-.071	-.17 (05)**	-.289	-.085
	SCBI	-.13 (04)**	-.224	-.065	-.17 (05)**	-.274	-.075
	SCBO	-.15 (04)**	-.234	-.078	-.15 (05)**	-.250	-.058
	PWB	-.15 (04)**	-.236	-.077	-.20 (05)**	-.318	-.010
	USB	.17 (04)**	.090	.258	.23 (05)**	.141	.335
	UHB	-.08 (04)**	-.166	-.022	.07 (05)	-.029	.169

Notes. Time I $N = 719$. Time II $N = 571$. * $p < .05$; ** $p < .01$; LLCI = Lower level confidence interval; ULCI = Upper level confidence interval. IRSB = In-role Safety Behaviour. SCBI = Safety Citizenship – Individual. SCBO = Safety Citizenship – Organization. PWB = Psychological well-being. USB = Unsafe behaviour. UHB = Unhealthy behaviour.

Indirect effects of breach on safety behaviour via violation then cognitive failure

Table 5.7 also presents indirect effect sizes of the serial mediation of breach on outcomes via violation and cognitive failure.

Comparisons of Table 5.7 below and Table 5.6 above, indicate that the combined mediating effects of violation and cognitive failure on safe and unsafe behaviour are stronger than for the individual mediating effects of violation or cognitive failure alone, suggesting that the effects are additive in nature. As with the sole mediation of violation, the findings regarding the indirect effect of breach on unhealthy behaviour (UHB) via violation and cognitive failure together are

equivocal. Comparison of Table 5.7 with Table 5.6 suggests that the relationship of breach with individuals smoking more, drinking more alcohol or taking less exercise are as a result of self-control failure rather than anger or frustration.

Indirect effects of breach on accident propensity

In the last set of analyses, the mediated effects of cognitive failure on accident outcomes via unsafe behaviour is examined (H15) as well as the mediated effect of cognitive failure via unhealthy behaviour on health outcomes (H16).

Applying joint significance testing again, as demonstrated in Figures 5.3 and 5.4 above, both violation and cognitive failure have a direct relationship with unsafe behaviour. Unsafe behaviour also has a direct relationship with accident propensity but for the first sample only ($\beta_{Time 1} = .15, p < .01$). Unhealthy behaviour (UHB) has a non-significant relationship with health outcomes and thus indirect effects are not examined; H16 is unsupported.

Table 5.8 below indicates that H15 is partially supported; cognitive failure, but not violation, is indirectly associated with individuals taking short cuts and subsequent increased accident and near miss involvement.

Table 5.8

Indirect path estimates (bootstrapped) with 95% confidence intervals for breach on accident propensity via unsafe behaviour.

Factor and statistic		Time 1		
		β (SE bootstrap)	LLCI	ULCI
<i>Indirect through unsafe behaviour</i>				
Violation	Accident propensity	.024 (02)	-.009	.063
Cognitive failure	Accident propensity	.056 (02)*	.011	.104
<i>Indirect through cognitive failure and unsafe behaviour</i>				
Breach	Accident propensity	.037 (01)**	.013	.063

Notes. Time 1 N = 719. ** $p < .01$; LLCI = Lower level confidence interval; ULCI = Upper level confidence interval.

RQ4a. To what extent does self-regulatory focus moderate the relationship of breach with violation and cognitive failure?

Table 5.9 displays the goodness-of-fit statistics of the structural model for the moderation analyses. Figure 5.5 depicts moderating effects of Self-Regulatory Focus at Work (SRF) on the relationship of breach with violation.

The conditional effects of production and prevention oriented SRF on violation and cognitive failure were assessed in AMOS following the procedure demonstrated by Gaskin (2012) and outlined by Muller and colleagues (Muller, Judd, & Yzerbyt, (2005) and by Preacher and colleagues (Preacher, Rucker, & Hayes, 2007). First, all variables were mean centred to avoid multicollinearity of the terms when multiplied (Aiken, West, & Reno, 1991). This included the mediating variable breach and two levels of the moderating variable self-regulatory focus (SRF); namely, production and prevention orientation. Paths between breach, production SRF, prevention SRF and their interactions were regressed simultaneously onto violation and cognitive failure. To ascertain the effect size of each term, paths were deleted in turn and change in the R^2 value calculated. These data are presented in Table 5.10.

Table 5.9
Goodness-of-fit indices for structural models where self-regulatory focus moderates breach.

Model	<i>N</i>	χ^2	<i>df</i>	CFI	RMSEA	SRMR
Time I	719	1806	687	.921	.048	.0668
Time II	571	1855	687	.913	.055	.0876

Notes. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Hypotheses 17 and 18 proposed that self-regulatory focus moderates the positive relationships between breach and violation and between breach and cognitive failure, such that a production orientation weakens the relationship of breach with violation and strengthens the relationship of breach with cognitive failure (H17). For prevention orientation, H18 stated that a strong prevention focus weakens the relationship with violation and cognitive failure.

Results in Table 5.10 and Figure 5.5 show that only H18 is partially supported. Prevention self-regulatory focus dampens the relationship of breach with violation ($\beta_{Time I} = -.12, p < .001$). Individuals who are more skilled at emotional control do not exhibit the same levels of violation when they experience breach. However, this finding was not replicated in the Time II data. This is largely due to the fact that prevention was weaker in its suppression effect on breach and breach's effect on feelings of violation was stronger in the second sample.

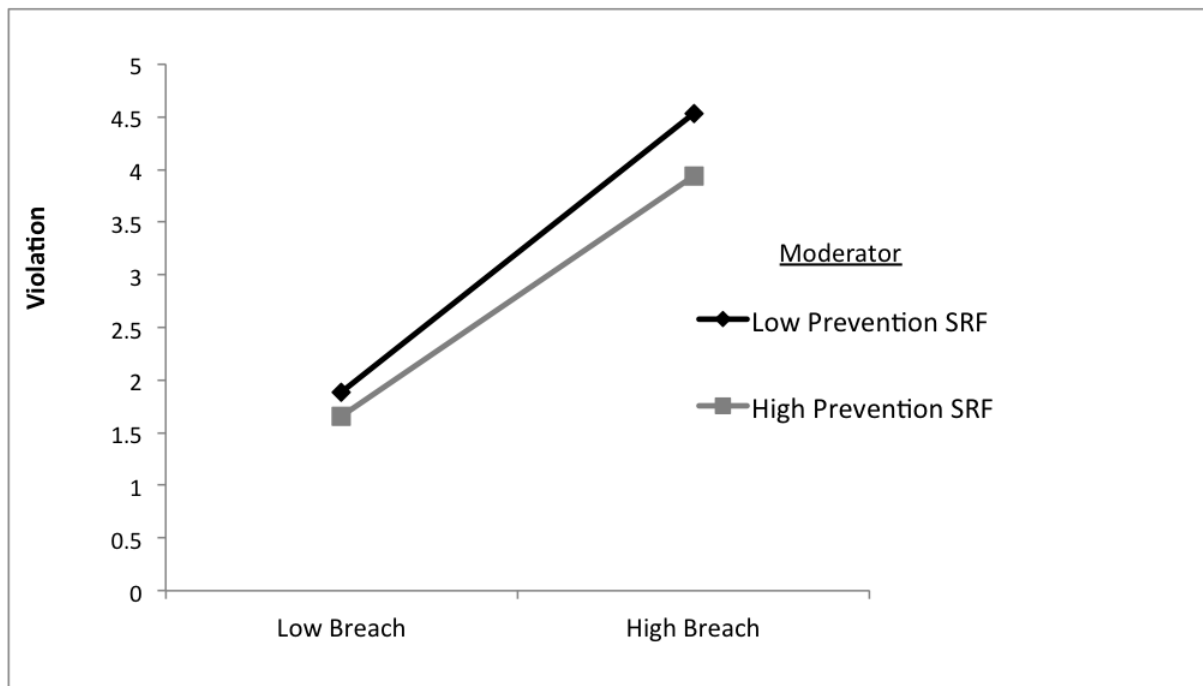


Figure 5.5 Interaction of breach and prevention self-regulatory focus on feelings of violation (Time I data).

Table 5.10

Moderating effects of self-regulatory focus at work on breach.

Factor and statistic	Violation			Cognitive failure		
	β	SE	R^2	β	SE	R^2
Time I						
Breach, moderator and interactions			.48			.16
Breach controlling for moderator	.60***	.13	.26	.09 [†]	.07	.00
Production SRF	.08	.05		.05	.05	
Prevention SRF	-.22***	.05	.02	-.40***	.06	.09
Production x Breach	.04	.03		.05	.01	
Prevention x Breach	-.12***	.03	.01	-.01	.01	
Time II						
Breach, moderator and interactions			.58			.23
Breach controlling for moderator	.67***	.23	.30	.30***	.06	.07
Production SRF	-.02	.09		-.00	.09	
Prevention SRF	-.16***	.04	.00	-.35***	.04	.05
Production x Breach	.06	.02		.09 [†]	.02	.01
Prevention x Breach	-.07 [†]	.03		-.04	.03	.00

Notes. SRF = Self-regulatory Focus at Work. [†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with behavioural outcomes?

Hypotheses regarding the moderating effect of emotion-regulatory strategy on behavioural outcomes were tested using SEM. Table 5.11 below indicates that the structural model represented a good fit to the data on both occasions. Table 5.12 and Figures 5.6 and 5.7 display results of the assessment of total, moderating and interaction effects.

Hypotheses 19 proposed that an antecedent-focussed emotion regulation strategy (A-ERS) dampens the negative relationship between violation and in-role safety behaviours, safety citizenship behaviours and the positive relationship with unsafe behaviour. H19 also predicted that a response-focussed emotion regulation strategy (R-ERS) strengthens the negative relationship between violation and safety behaviour as well as strengthening the positive relationship between violation and unsafe behaviour.

Hypothesis 20 proposed that employees reporting a strong antecedent-focused ERS will experience reduced negative consequences of cognitive failures on safe and unsafe behaviour. Individuals reporting a strong response-focused ERS will experience the negative effects of cognitive failure on their safety behaviour more strongly such that they will have a reduced capacity to perform safe behaviours as well as a reduced capacity to avoid unsafe behaviour.

Table 5.11

Goodness-of-fit indices for structural models where emotion regulation strategy moderates violation and cognitive failure.

Model	<i>N</i>	χ^2	<i>df</i>	CFI	RMSEA	SRMR
Time I	719	1752	727	.930	.044	.0535
Time II	571	1788	727	.921	.051	.0609

Notes. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

None of the interactions of A-ERS with violation were significant in predicting outcomes; this emotion regulation strategy does not appear to dampen negative affect such as violation. On the other hand, a response-focussed emotion regulation strategy increases the effect of violation and exacerbates an individual's propensity to behave unsafely ($\beta = .12, p < .01$). This is repeated for the Time II sample.

Table 5.12

Moderating effects of emotion-regulation strategy on violation and cognitive failure.

Predictor	Criterion	Time I		Time II	
		β (SE)	R^2	β (SE)	R^2
AERS	IRSB	.36 (.04)***	.06	.27 (.05)***	.01
	SCBO	.31 (.06)***	.05	.42 (.07)***	.07
	SCBI	.33 (.06)***	.02	.43 (.06)***	.07
	PWB	.45 (.04)***	.11	.46 (.07)***	.08
	USB	-.17 (.04) **	.02	-.13 (.05) *	.00
RERS	IRSB	-.18 (.04) **	.00	-.16 (.05) *	.00
	SCBO	-.22 (.06) **	.01	-.25 (.07) ***	.03
	SCBI	-.18 (.05) ***	.01	-.22 (.06) **	.02
	PWB	-.25 (.04) ***	.02	-.26 (.07) ***	.04
	USB	.26 (.04) ***	.01	.30 (.06) ***	
RERS X V	USB	.12 (.03) **	.01	.13 (.03) **	.01
AERS X CF	IRSB	.06 (.02)		.13 (.03) *	.00
	SCBO	.10 (.04) *	.01	.12 (.04) *	.01
	SCBI	.16 (.03) ***	.02	.09 (.03)	
RERS X CF	SCBI	-.10 (.03) *	.00	.02 (.03)	
	PWB	-.09 (.02) *	.01	.05 (.04)	

Notes. V = Violation. CF = Cognitive Failure. AERS = Antecedent-focused Emotion Regulation Strategy. RERS = Response-focused Emotion Regulation Strategy. IRSB = In-role Safety Behaviour. SCBO = Safety Citizenship - Organization. SCBI = Safety Citizenship - Individual. PWB = Psychological well-being. USB = Unsafe behaviour. * p < .05; ** p < .01; *** p < .001

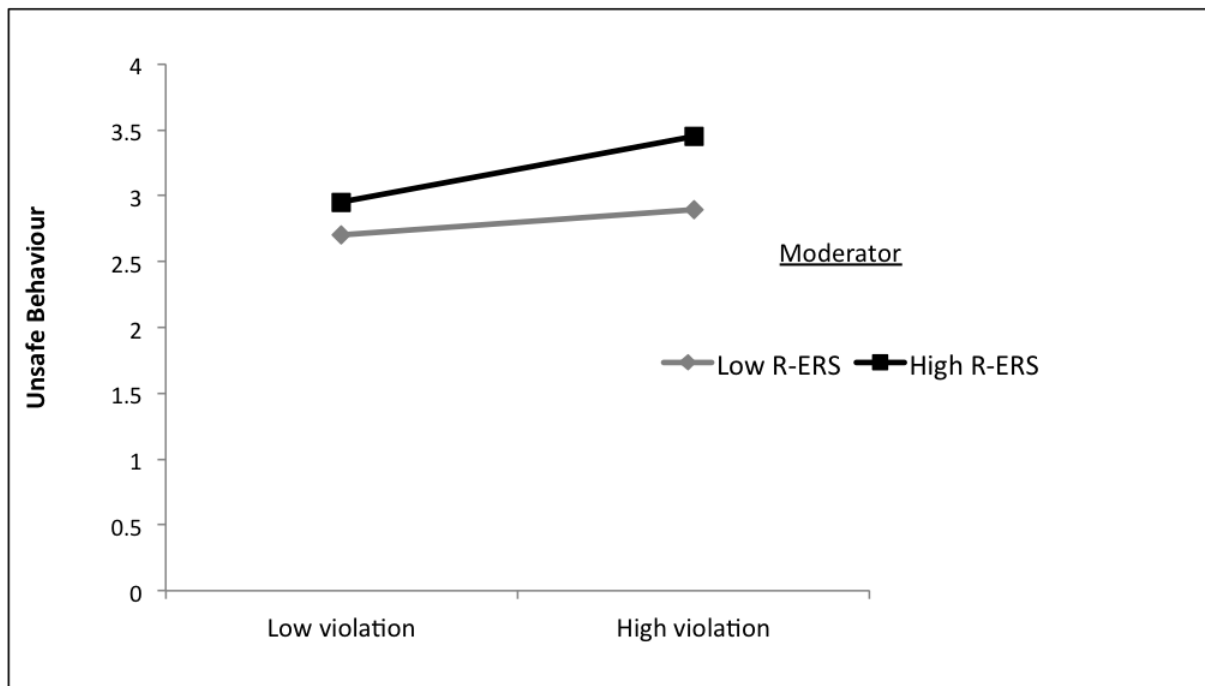


Figure 5.6 Moderation of the effects of violation on unsafe behaviour.

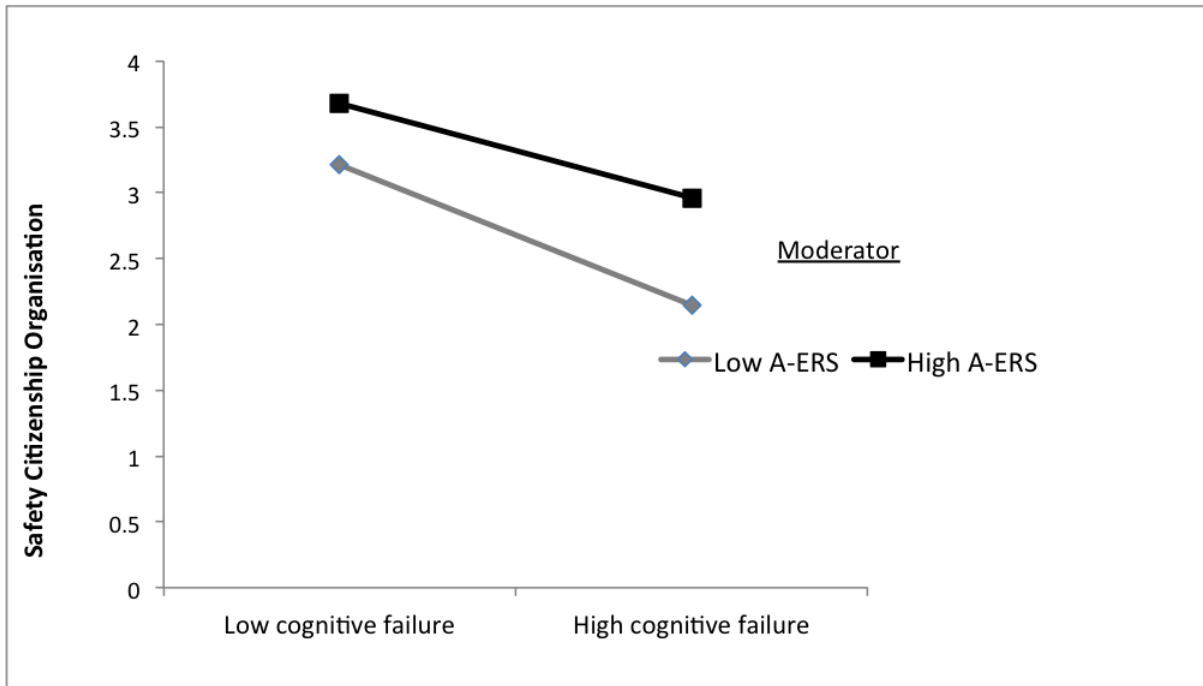


Figure 5.7 Moderation of the effects of cognitive failure on safety citizenship towards the organisation.

In relation to cognitive failure, an A-ERS alleviates the effects of cognitive failure on safety citizenship towards the organisation, affording individuals greater attentional capacity to engage in these behaviours ($SCBO_{Time I} \beta = .10, p < .05$; $SCBO_{Time II} \beta = .12, p < .05$). It would appear that this strategy also increases individuals' capacity to engage in in-role safety behaviours and safety citizenship towards colleagues. However, given that these findings were only recorded for one of the samples, the results are deemed tentative.

A response-focused strategy appears to dampen an individual's capacity to engage in safety citizenship towards colleagues and augments the negative relationship of cognitive failure with psychological well-being. However, once again these effects were only present for one sample. Significant interactions for both samples are displayed in Figures 5.6 and 5.7 above.

5.4.5 Longitudinal results

This section reports a series of longitudinal analyses conducted to establish the direction of the relationships between the independent, mediating and dependent variables deployed in this research.

The results arising from the cross-sectional analyses reported above provide strong support for the proposition that breach and cognitive failure have important relationships with safety behaviours as well as employee health and well-being. Psychological contract fulfilment and violation have fewer and sometimes weaker, but nonetheless important, relationships with health and safety outcomes too. However, there are limitations to cross-sectional data. Imputing cause and effect is not possible, as the direction of the relationship remains obscured.

Additionally, in cross-sectional research where both predictor and dependent variables are measured simultaneously, the implied assumption is that the hypothesised effect is instantaneous rather than occurring over time (Selig & Preacher, 2009). This may or may not be true for predictors or mediators. Testing the relationships between predictor and dependent variables over time enables the “shelf-life” of the effect to be ascertained (Ployhart & Vandenberg, 2010). Where cross-sectional effects are significant, but longitudinal ones are not, the implication is that the effect is transient or a third variable is involved.

Model specification

Figure 5.8 depicts the model specification for the longitudinal SEM analyses. As discussed above, the change score approach is employed after Finkel (1995) wherein initial levels of both independent and dependent variables are controlled for. While the change score approach falls short of enabling causal inference, it does provide a more robust test of the hypotheses than cross-sectional analyses. It allows the researcher to examine how two constructs co-vary over time and how change in one variable relates to change in another.

As depicted in Figure 5.8, the relationship between the Independent (IV) and Dependent Variable (DV) at Time 2 is that which is unique after the autoregressive variance has been accounted for. Autoregressive variance occurs because two scores contributed by one individual on the same indicator are dependent and thus will correlate (Hoyle, 2011). Assuming measurement invariance, the extent to which the two scores are correlated is an indication of the stability of the constructs. Measurement invariance was established in the cross-sectional analyses; factor loadings did not vary significantly between the first and second waves (see Table 5.4, p. 144). Accordingly, and in order to preserve degrees of freedom, the loading of each indicator on its factor was constrained to be equal across time lags. In the absence of guidance

on the longevity of fulfilment and breach, this will be a useful indicator of the stability or volatility of the psychological contract.

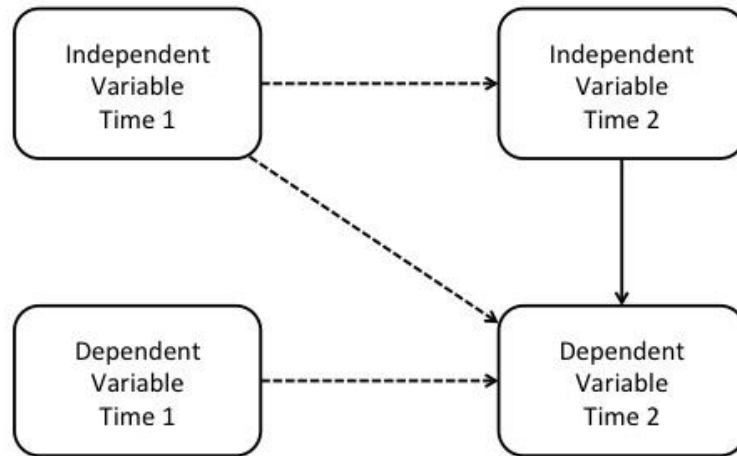


Figure 5.8 Predicting change over time.

Note. The solid arrow represents the change in the dependent variable associated with change in the independent variable.

Direct and indirect relationships are tested using SEM and the change-score design. Each path of the hypothesised model is tested using longitudinal data collected from a subset of the Time I and Time II respondents. The analyses reported below show whether Time II psychological contract fulfilment and breach are related to Time II health and safety outcomes via violation and cognitive failure while controlling for baseline levels of the predictor and mediating variables as well as baseline levels of the health and safety outcomes.

Mediation analyses

Joint significance testing of predictor to mediator and mediator to dependent variables is conducted to determine whether indirect effects are present (MacKinnon et al., 2002). Bootstrapping was deployed to establish the significance of indirect effects; 1,000 re-samples were tested and bias-corrected 95% confidence intervals were used to establish significance as recommended by Hayes (2013). Where the upper and lower bounds did not include zero, the parameter estimate is deemed to be significant. Additionally, given the small sample and complexity of the model, in order to rule out spurious results, parameter estimates for indirect effects were confirmed through multiple regression using SPSS and the MEDIATE macro (Hayes, 2013).

Measurement model results

Table 5.13 displays goodness-of-fit statistics obtained for the measurement models for the longitudinal data set.

Confirmatory factor analyses were computed to establish the fit of the ten-factor, full model to the data. This model (Model 1) contains the factors measured on two occasions; namely psychological contract fulfilment, global breach, violation, cognitive failure, psychological well-being, in-role safety behaviour, safety citizenship towards individuals and towards the organisation, and unsafe and unhealthy behaviour. It contains the same indicators and item parcels as used in the cross-sectional analyses. The alternative model (Model 2) removes the fulfilment items (reverse scored) on the Breach factor at Time I and at Time II as this was responsible for considerable misfit¹. The finding that the reverse-scored items factored out separately is not uncommon (see Carlson et al., 2011). Model 2 also removes one item on the cognitive failure factor at Time I and Time II: remembering people's names. The difference between Model 1 and 2 was statistically significant ($\chi^2_{(1676)} = 2943$, $\Delta\chi^2_{[345]} = 738$, $p < .01$).

In Model 3, the first nested model, item loadings were constrained to be equal across time. This nested model did not significantly alter the model fit, but provides for a greater number of degrees of freedom. Thus, it is considered a preferred model given the relatively small sample size of $N = 99$.

In the second nested model (Model 4), the error disturbance terms of items at both time lags were allowed to covary to control for autoregressive variance. Model 4 significantly improved model fit over Model 3 ($\chi^2_{(1322)} = 2145$, $\Delta\chi^2_{[28]} = 89$, $p < .01$). While Model 4 reached acceptable goodness-of-fit on RMSEA = .08 (0.05 to 0.08; [Browne et al., 1993]) it failed to reach the threshold for the Comparative Fit Index (CFI) of 0.95 as recommended by Hu and Bentler (1998), CFI = .814. Taken together these results suggest a less than ideal fit of the measurement model to the data, which could lead to erroneous conclusions about regression weights in the structural models. This model misspecification is likely to be the result of the number of parameters being estimated for the sample size ($N = 99$). Therefore, the decision was taken to construct measurement models for each outcome variable separately thereby reducing the number of factors from 10 to 4 and thus the number of parameters to be estimated. Table 5.13 also displays goodness-of-fit indices for these individual models (Models 5 to 10). All factor

¹ Given this finding, the measurement models in the cross-sectional analyses were revisited. Model fit was re-assessed with and without the reverse-scored fulfilment items of the breach scale. Whereas the chi-square difference test was significant, $\Delta\chi^2_{[80]} = 214$, $p < .05$, the more appropriate Δ CFI test for large samples was less than .10 (Δ CFI = .006) and thus the cross-sectional analyses were left unchanged; i.e. the measure of breach contained the reverse-score fulfilment items.

loadings were statistically significant beyond the .01 level. These separate measurement models are now taken forward into the structural models.

Table 5.13
Goodness-of-fit indices for longitudinal measurement models.

Model		χ^2	<i>df</i>	CFI	RMSEA	SRMR
1	Full measurement (9 factors)	2943	1676	.745	.088	.082
2	Alternative measurement (reduced indicators)	2205	1331	.803	.082	.070
3	Nested (constrained factor loadings)	2234	1350	.800	.082	.071
4	Nested model (T1 to T2 indicator error terms covary)	2145	1322	.814	.080	.070
5	PWB only	537	355	.900	.072	.066
6	IRSB only	545	414	.932	.057	.063
7	SCBI only	476	355	.941	.059	.058
8	SCBO only	455	355	.946	.054	.057
9	USB only	548	355	.897	.074	.066
10	UHB only	414	272	.909	.073	.066

Notes. *N* = 99. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. PWB = Psychological well-being. IRSB = In-role Safety Behaviour. SCBO = Safety Citizenship – Organization. SCBI = Safety Citizenship – Individual. USB = Unsafe behaviour. UHB = Unhealthy behaviour. Model 1 contains the 10 factors measured on the two occasions. Model 2 removes two indicators of the Breach factor and one indicator of the Cognitive Failure factor. Models 5 to 10 contain 4 factors.

Structural model results

Structural model goodness-of-fit estimates are displayed in Table 5.14. Figure 5.9 depicts the structural model for the motivation pathway for In-role Safety Behaviour.

Despite separating models into these constituent parts, parameter to sample size ratios never reached Kline’s 1:5 figure. However, Wolf and colleagues (Wolf, Harrington, Clark, & Miller, 2013) advise that where factor loadings are high, sample size can be reduced. Factor loadings were all in excess of 0.6. However, in order to maintain sample size to parameter ratios as close to 1:5 as possible, path coefficients are estimated separately for each mediation pathway for each outcome (e.g., see Figure 5.9).

All models represented adequate model fit for the small sample size. For all outcomes the CFI is close to .90 and, with the exception of some outcomes associated with the motivation pathway, the SRMR is < .08. The RMSEA fit statistic is also within the range of 0.05 to 0.08 specified by Browne et al. (1993).

Table 5.14

Goodness-of-fit indices for longitudinal structural models.

Model	χ^2	df	CFI	RMSEA	SRMR	R ²
PWB						
PCV path	367	232	.912	.077	.063	.67
CF path	265	189	.927	.064	.068	.66
IRSB						
PCV path	388	279	.934	.063	.089	.17
CF path	276	232	.962	.044	.079	.30
SCBI						
PCV path	319	232	.951	.062	.082	.18
CF path	231	189	.968	.048	.074	.23
SCBO						
PCV path	294	232	.961	.052	.073	.29
CF path	207	189	.984	.031	.065	.34
USB						
PCV path	347	232	.926	.071	.084	.26
CF path	286	189	.911	.072	.079	.27
UHB						
PCV path	221	153	.947	.067	.082	.56
CF path	138	118	.975	.042	.068	.60

Notes. N = 99. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. R² indicates the amount of variance explained by all the variables in the model. PCV = Psychological contract violation. CF = Cognitive failure. PWB = Psychological well-being. IRSB = In-role Safety Behaviour. SCBO = Safety Citizenship – Organization. SCBI = Safety Citizenship – Individual. USB = Unsafe behaviour. UHB = Unhealthy behaviour.

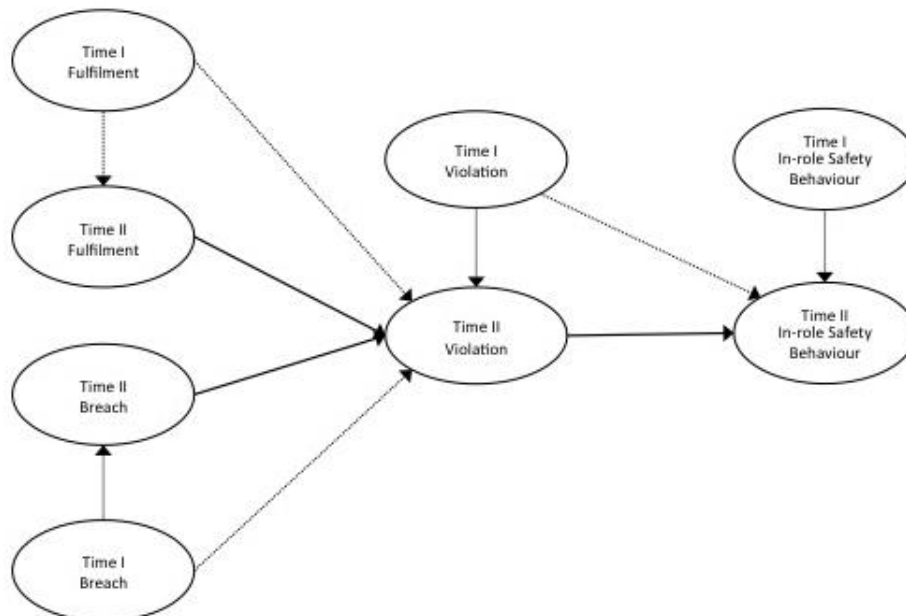


Figure 5.9 Structural model for the motivation pathway and in-role safety behaviour.

Note. Solid line denotes change score estimates.

Table 5.15*Path estimates (standardised) of lagged relationships between variables.*

Predictor (Time I)	Criterion (Time II)	β
Fulfilment	Fulfilment	.44***
Breach	Breach	.36**
Violation	Violation	.12
Cognitive failure	Cognitive failure	.45***
Psychological well-being	Psychological well-being	.78***
In-role safety behaviour	In-role safety behaviour	.34**
Safety citizenship – individual	Safety citizenship – individual	.42***
Safety citizenship – organisation	Safety citizenship – organisation	.53***
Unsafe behaviour	Unsafe behaviour	.42***
Unhealthy behaviour	Unhealthy behaviour	.75***
Breach	Violation	-.07
	Cognitive failure	-.17
Fulfilment	Violation	-.10
	Cognitive failure	-.19
Violation	Psychological well-being	.05
	In-role safety behaviour	-.12
	Safety citizenship – individual	.04
	Safety citizenship – organisation	-.02
	Unsafe behaviour	-.13
	Unhealthy behaviour	.08
Cognitive failure	Psychological well-being	.14
	In-role safety behaviour	.05
	Safety citizenship – individual	.08
	Safety citizenship – organisation	.10
	Unsafe behaviour	.18
	Unhealthy behaviour	.25**

Notes. $N = 99$. ** $p < .01$; *** $p < .001$

The results presented in Table 5.15 above indicate that all variables bar violation showed significant stability between Time I and II. Violation at Time I did not predict violation at Time II, suggesting that it has a shorter shelf life than six months; i.e. feelings of anger and frustration appear to dissipate. On the other hand, fulfilment and psychological well-being would appear relatively stable over this time period, with the latter showing the greatest stability with more than 60% of the variance at Time II accounted for by variance in well-being at Time I.

In respect of lagged scores, all relationships, bar that of cognitive failure at Time I to unhealthy behaviour at Time II, are non-significant. This latter finding suggests that the relationship between attentional lapses and self-control failure endures over a six-month time frame.

Direct effects of predictors on mediators

The first stage in establishing mediation is to assess the direct effect of the predictors, fulfilment and breach, on the mediators, violation and cognitive failure. This also represents a test of hypotheses H2 to H6 and the precepts that breach and fulfilment impact individuals' motivational and attentional experiences. Table 5.16 presents the change scores of Time II predictor to Time II mediator and indicates that H2 is unsupported whereas H3 is partially supported. Changes in fulfilment do not appear to associate with changes in feelings of violation. On the other hand, changes in breach are positively associated with changes in violation ($\beta = .78, p < .001$).

Table 5.16

Change score (standardised) analyses for predictors to mediators (X → M).

Predictor (Time II)	Criterion (Time II)	β
<i>Time II to Time II – change scores</i>		
Fulfilment	Violation	.02
Fulfilment	Cognitive failure	.37**
Breach	Violation	.78***
Breach	Cognitive failure	.41**
Violation	Cognitive failure	.03

Notes. N = 99. † p < .10; * p < .05; ** p < .01; *** p < .001

Where attentional experiences are concerned, the findings are mixed. The change scores are contrary to expectations in respect of fulfilment (H4), but support hypotheses in respect of breach (H5).

Changes in fulfilment over six months are positively related, rather than negatively related, to changes in cognitive failure suggesting that the more one experiences a fulfilled psychological contract, the more one's attentional resources become depleted ($\beta = .37, p < .01$). If this is indicative of over-fulfilment, then the attentional lapses might be interpreted as a stress response to the pressure to reciprocate (Guest, 1998). Alternatively, they might be indicative of complacency arising from the employer's over indulgence. In any event, H4 is unsupported. Changes in breach are positively related to changes in cognitive failure ($\beta = .41, p < .01$) thereby supporting H5.

H6, in which violation was expected to positively relate to cognitive failure, is unsupported. Changes in violation do not appear to relate to changes in cognitive failure. This path is dropped from all subsequent analyses.

Hypotheses H7 predicted that violation and H11 that cognitive failure would mediate the positive relationship of fulfilment with well-being and pro-safe behaviours. Hypotheses H8 and H12 predicted that fulfilment would relate negatively to unsafe and unhealthy behaviour via violation and cognitive failure. As fulfilment did not relate significantly to violation, and related in the opposite direction to that predicted for cognitive failure, these hypotheses are unsupported, (see Table 5.16 above). Therefore, no analyses of the indirect effects of fulfilment are undertaken, only the indirect effects of breach are assessed.

Direct effects of mediators on outcomes

The second stage in estimating mediation is to assess the direct effects of the mediator on the outcomes. Table 5.17 depicts the change score estimates for Time II violation and Time II cognitive failure to Time II outcomes. Both violation and cognitive failure's changes scores relate significantly to some outcomes, but not all.

Table 5.17

Change score (standardised) analyses for violation and cognitive failure to psychological well-being, pro-safe behaviours, unsafe and unhealthy behaviours (M → Y).

Predictor (Time II)	Criterion (Time II)	β
<i>Time II to Time II – change scores</i>		
Violation	PWB	-.25*
	IRSB	.03
	SCBI	-.09
	SCBO	-.02
	USB	.32**
	UHB	-.05
Cognitive failure	PWB	-.25*
	IRSB	-.38**
	SCBI	-.26*
	SCBO	-.26*
	USB	.23†
	UHB	-.13

Notes. N = 99. PWB = Psychological well-being. IRSB = In-role Safety Behaviour. SCBO = Safety Citizenship – Organization. SCBI = Safety Citizenship – Individual. USB = Unsafe behaviour. UHB = Unhealthy behaviour. † p < .10. *p < .05. **p < .01.

The only outcomes to which change scores in violation were significantly related were changes in psychological well-being and unsafe behaviour (PWB, $\beta = -.25$, $p < .05$; USB, $\beta = .32$, $p < .01$). Therefore, in subsequent analyses, violation's mediation role is only assessed in respect of these outcomes.

In respect of cognitive failure, change scores were significant in relation to change scores in psychological well-being and all pro-safe but not unsafe and unhealthy behaviours (PWB, $\beta = -.25, p < .05$; IRSB, $\beta = -.38, p < .01$; SCBI, $\beta = -.26, p < .05$; SCBO, $\beta = -.26, p < .05$). Therefore, indirect effects of breach via cognitive failure are assessed only in relation to psychological well-being and pro-safe behaviours. Changes in cognitive failure do not relate significantly to unsafe and unhealthy behaviours and thus indirect effects of breach on these outcomes are not assessed.

Indirect effects of breach on outcomes via the motivational and attention pathways are reported in Table 5.18 overleaf.

Predicting Time II Psychological well-being

The indirect effect of breach on well-being via violation (H9) is significant, but its effect via cognitive failure (H13) do not reach accepted levels of significance. Violation mediates the negative relationship of changes in breach with changes in psychological well-being (PWB, $B = -.19, [CI, -.389 \text{ to } -.039], p < .05$). Changes in individuals' psychological well-being appears negatively related to the violation they experience when their employer lets them down.

Predicting Time II In-role Safety Behaviour

H9 is unsupported in respect of this outcome; violation is not related to changes in in-role safety behaviour and thus analyses of indirect effects are not performed.

The indirect effect of breach via cognitive failure on in-role safety behaviour is significant, indicating changes in an employer's commitments have a negative impact on individual's attentional resources, which has detrimental consequences for their safety behaviour (IRSB, $B = -.14, [CI, -.387 \text{ to } -.058], p < .01$). H13 is thus supported in that cognitive failure mediates the relationship of changes in breach on changes in in-role safety behaviour.

Predicting Time II Safety Citizenship Behaviour towards Individual and Organisation

Once again, H9 is unsupported in respect of these outcomes; violation is not related to changes in either safety citizenship behaviours and thus analyses of indirect effects are not performed.

The indirect effects of breach on safety citizenship behaviours towards colleagues and the organisation via cognitive failure are significant, supporting H13, (SCBI, $B = -.15, [CI, -.418 \text{ to } -.024], p < .05$; SCBO, $B = -.17, [CI, -.591 \text{ to } -.027], p < .05$).

Individuals' capacity to engage in safety citizenship behaviours appears to be compromised through the effect of breach on their attentional resources.

Table 5.18

Indirect path estimates (unstandardised) of breach on outcomes via violation and cognitive failure.

Factor and statistic	Criterion	Beta	LLCI	ULCI
<i>Indirect through violation</i>				
Breach (T2)	PWB (T2)	-.19*	-.389	-.039
Breach (T2)	USB (T2)	.41***	.166	.997
<i>Indirect through cognitive failure</i>				
Breach (T2)	PWB (T2)	-.09†	-.253	.007
Breach (T2)	IRSB (T2)	-.14**	-.387	-.058
Breach (T2)	SCBI (T2)	-.15*	-.418	-.024
Breach (T2)	SCBO (T2)	-.17*	-.591	-.027

Notes. $N = 99$. LLCI = Lower level confidence interval; ULCI = Upper level confidence interval. PWB = Psychological well-being. IRSB = In-role Safety Behaviour. SCBO = Safety Citizenship – Organization. SCBI = Safety Citizenship – Individual. USB = Unsafe behaviour. UHB = Unhealthy behaviour. † $p < .10$ * $p < .05$. ** $p < .01$. *** $p < .001$.

Predicting Time II Unsafe and Unhealthy Behaviours

Mediation analyses were only carried out for the indirect effects of breach on unsafe behaviour via violation (H10) and not unhealthy behaviour, as the change scores of violation were not associated with this outcome (see Table 5.17, page 169). H10 expected that individuals' experience of violation would predict the extent of their unsafe behaviour as a consequence of breach. The estimate of the indirect effect of breach on unsafe behaviour via violation is highly significant (USB, $B = .41$, [CI = .166 to .997], $p < .001$) indicating that unsafe behaviour is motivated behaviour, potentially as an act of revenge or as a consequence of the incompatibility of feelings of violation with engaging in rule-following behaviour.

Cognitive failure did not predict unsafe behaviour to accepted levels of significance and thus H14 is unsupported; cognitive failure does not appear to mediate the positive relationship between breach and unsafe behaviour. No mediation analyses are carried out for unhealthy behaviour (UHB) as neither change in violation nor change in cognitive failure predicted change in behaviours considered a health risk.

5.4.6 Summary

Table 5.19 summarises the results of the cross-sectional and longitudinal analyses according to the hypotheses.

Table 5.19

Summary of results by hypotheses (continued overleaf).

Hypothesis	Results
H1a: Fulfilment positively predicts and breach negatively predicts psychological well-being and pro-safe behaviour.	Largely supported. Cross-sectionally, fulfilment positively relates to well-being and all pro-safe behaviours. Longitudinally, effects are non-significant or contrary to predictions. Cross-sectionally, breach relates negatively to well-being and all pro-safe behaviours. Longitudinally, effects are significant for well-being via violation and pro-safe behaviours via cognitive failure.
H1b: Fulfilment negatively predicts and breach positively predicts unsafe and unhealthy behaviour.	Largely supported. Cross-sectionally, fulfilment negatively associates with unsafe but not unhealthy behaviour. Longitudinally, effects are non-significant or contrary to predictions. Breach positively associates with unsafe and unhealthy behaviour via cognitive failure. Longitudinally, effects are significant for unsafe behaviour via violation.
H2: Fulfilment negatively predicts violation	Partially supported for the cross-sectional samples but not the longitudinal sample.
H3: Breach positively predicts violation	Supported across all samples.
H4: Fulfilment negatively predicts cognitive failure	Unsupported. Contrary to predictions, cross-sectionally the relationship was non-significant and longitudinally, changes in fulfilment were positively associated, not negatively associated, with changes in cognitive failure.
H5: Breach positively predicts cognitive failure.	Supported across all samples.
H6: Violation positively predicts cognitive failure.	Partially supported in the cross-sectional samples.

Hypothesis	Results
<p>H7: Violation mediates the positive relationship of fulfilment with psychological well being and pro-safe behaviour.</p>	<p>Partially supported. For the cross-sectional samples, the indirect relationship of fulfilment on pro-safe outcomes via violation is positive and significant. In the longitudinal sample, changes in fulfilment did not associate with changes in violation.</p>
<p>H8: Violation mediates the negative relationship of fulfilment with unsafe and unhealthy behaviour.</p>	<p>Partially supported in respect of unsafe behaviour for the cross-sectional samples but not the longitudinal sample.</p>
<p>H9: Violation mediates the negative relationship of breach with psychological well being and pro-safe behaviour.</p>	<p>Partially supported. Across all samples, breach negatively relates to psychological well-being via violation, but the relationship with withdrawal of pro-safe behaviour is only significant in the cross-sectional samples.</p>
<p>H10: Violation mediates the positive relationship of breach with unsafe and unhealthy behaviour.</p>	<p>Largely supported. Cross-sectionally and longitudinally breach indirectly predicts unsafe behaviour via violation, but not unhealthy behaviour.</p>
<p>H11: Cognitive failure mediates the positive relationship of fulfilment with well-being and pro-safe behaviour.</p>	<p>Unsupported Contrary to predictions, cross-sectional relationships were non-significant and longitudinally, changes in fulfilment were positively related to cognitive failure.</p>
<p>H12: Cognitive failure mediates the negative relationship of fulfilment with unsafe and unhealthy behaviour.</p>	<p>Unsupported.</p>
<p>H13: Cognitive failure mediates the negative relationship of breach with well-being and pro-safe behaviour.</p>	<p>Supported across all samples.</p>
<p>H14: Cognitive failure mediates the positive relationship of breach with unsafe and unhealthy behaviours.</p>	<p>Partially supported Consistent support in the cross-sectional samples. Unsupported in the longitudinal sample on account of the non-significant relationship of cognitive failure to either outcomes.</p>
<p>H15: Unsafe behaviour mediates the positive relationship of breach with accidents via violation and cognitive failure.</p>	<p>Supported for the cross-sectional samples. Not examined longitudinally.</p>
<p>H16: Unhealthy behaviour mediates the positive relationship of cognitive failure with health outcomes.</p>	<p>Unsupported on account that unhealthy behaviour did not predict health outcomes.</p>
<p>H17a: A strong production-focus dampens individuals' feelings of violation in response to breach.</p>	<p>Unsupported.</p>
<p>H17b: A strong production-focus heightens individuals' susceptibility to cognitive failure in response to breach.</p>	<p>Unsupported.</p>

Hypothesis	Results
H18a: A weak prevention-focus heightens individuals' feelings of violation in response to breach.	Partially supported for the first sample.
H18b: A weak prevention-focus increases individuals' experience of cognitive failure in response to breach.	Unsupported.
H19a: Antecedent-focussed emotion-regulation dampens feelings of violation preserving motivation to behave safely.	Unsupported.
H19b: Response-focussed emotion-regulation heightens feelings of violation eroding motivation to behave safely.	Supported for unsafe behaviour only.
H20a: Antecedent-focussed emotion-regulation reduces cognitive failures preserving capacity to behave safely.	Supported for safety citizenship behaviour towards the organisation only.
H20b: Response-focussed emotion-regulation increases cognitive failures eroding capacity to behave safely.	Partially supported for well-being and safety citizenship towards colleagues in first sample only.

5.5 Discussion of results

This section summarises the results according to the research questions, but this is largely descriptive and a critical appraisal of the results comes in the final chapter of this thesis.

The primary aim of this study was to establish whether psychological contract fulfilment and breach could explain individual's health and safety behaviour and its withdrawal. Second, it sought to examine the zone of acceptance governing the limits of change to the psychological contract that employees will or can endure before they alter their behaviour. Two mediating mechanisms were tested; one which advocated that it is affect that determines the zone of acceptance and motivates individuals to intentionally up- or down-grade their safety contribution; and the other, that responses to fulfilment and breach are the unintentional consequences of changes in attentional resources, which influence employees' capacity to behave safely. Finally, the study considered personal disposition in self-regulatory focus and emotion regulation practices and how they moderate individuals' reactions to breach and the consequences of violation and cognitive failure for behaviour.

5.5.1 RQ1 What is the relationship of fulfilment and breach with health and safety outcomes?

Fulfilment perceptions related to behavioural outcomes in predicted ways, but sometimes in unexpected ways too. Fulfilment was positively related to psychological well-being, in-role safety behaviour, safety citizenship behaviour directed towards individuals and organisations, but was also positively related to unsafe behaviour in one sample. The fact that the direct effects were of similar magnitude as the total effects (where direct and indirect are combined), suggests that fulfilment's relationship with outcomes is largely independent of the mediators violation and cognitive failure.

The relationship of breach to outcomes was largely in line with expectations when total effects were considered. Breach was significantly related to poorer psychological well-being and more frequent unsafe behaviour, less frequent in-role safety behaviour and safety citizenship behaviour towards colleagues. Direct effects were largely non-significant indicating that the majority of the relationship of breach with outcomes was through the mediators violation and cognitive failure. The direct effect of breach and safety citizenship directed towards the organisation was positive where it was expected to be negative.

Although a partial mediation model was a better fit to the data indicating direct relationships were present, breach perceptions alone do not appear to be reliable indicators of individuals' behavioural intentions where their safe, unsafe and unhealthy behaviours are concerned. There are two possible explanations for this. Firstly, a belief in reciprocity and the obligation to exchange is not an important determinant of safety behaviour. This explanation would lend weight to the argument that social exchange is limited in its effects and people do not operate on a tit-for-tat basis (Conway & Briner, 2009; Conway & Coyle-Shapiro, 2012). The alternative explanation is that individuals working in safety-critical contexts are prevented from reciprocating their organisation's performance on its obligations because of the sanctions that might ensue and the harm they might cause themselves. Thus, a belief in the obligation to exchange might be present, but it is insufficient to influence individuals' behavioural intentions particularly in respect of withdrawing their safety contributions.

The consistent finding across cross-sectional samples was of the positive relationship of perceptions of fulfilment with psychological well-being. Individuals who perceived their organisation to be meeting its obligations experienced better mental health. This finding endorses other empirical studies that suggest fulfilled psychological contracts lead to flourishing employees (Guerrero & Herrbach, 2008). Additionally, breach related to poorer psychological well-being, suggesting a social exchange accounts is valid in respect of this

outcome; individuals who feel unable to reciprocate experience poorer mental health on account of their goal frustration (Berkowitz, 1993). Several scholars have expressed concern that individuals in helping occupations (e.g. teachers and nurses) who experience unreciprocated over commitment (e.g. Brown & Roloff, 2011; Quinlan & Bohle, 2009) go on to experience poor health and safety outcomes. These results point to the same process occurring in a safety context.

5.5.2 RQ2a. What is the relationship of fulfilment and breach with violation?

SEM analyses revealed that fulfilment negatively predicts violation in the cross-sectional samples, and breach consistently has a positive relationship with violation in the longitudinal as well as the cross-sectional samples.

Taking fulfilment first, it has been demonstrated previously that fulfilment is weaker in its positive effects than breach is in its negative effects (Conway et al., 2011) reflecting the negativity bias that has evolved to protect us from harmful situations and people (Baumeister et al., 2001). The results of this study generally support these findings, indicating that breach has stronger and more consistent relationships with individuals' sense of frustration and anger with their employer than fulfilment does, thereby lending support for treating the two constructs as distinct rather than as poles on a continuum.

The absence of a significant relationship with violation in the longitudinal study for fulfilment suggests that the effect of fulfilment is stable and perceptions thereof are resistant to the ups and downs of the employment relationship; changes in fulfilment over the six months did not predict changes in feelings of violation. Furthermore, there was considerable stability in the levels of fulfilment individuals experienced between measurement points, and considerable instability in levels of violation. This lends support to psychological contract theory's proposal that fulfilment leads to the formation of schema that are resistant to change (Rousseau, 2001) as well as supporting the call to consider affective experiences as distinct from fulfilment perceptions (Guerrero & Herrbach, 2008). However, given that positive affective experiences were not examined, this holds true for negative affect only.

In respect of breach-violation relationships, change scores indicated that the relationship between breach perceptions and affective experiences is very strong. Scholars have successfully argued that breach is a distinct construct from violation (Robinson & Morrison, 2000) and these data confirm their separation. However, given that the shared variance was in the region of 60%, the two constructs appear deeply connected, validating neuroscience's proposal for associative neural networks whereby thoughts and feelings are connected at nodes. When one

gets activated the other is also activated (Barsade et al., 2009). All told, these results support AET and the notion that events at work are affectively laden.

5.5.3 RQ2b. What is the relationship of fulfilment and breach with cognitive failure?

The relationship of breach to cognitive failure was largely consistent with an ego depletion perspective. There was a positive relationship between the experience of broken promises and memory lapses, distractions and blunders in one of the cross-sectional samples. In the other cross-sectional sample, breach was only positively related to cognitive failure when the relationship between violation and cognitive failure was not estimated. As theorised by Muraven and Baumeister (2000), these findings indicate that both coping with stress (breach) and managing negative emotions (violation) are ego depleting. For one sample, the stress of knowing that one's employer had reneged on its commitments was sufficient to explain the cognitive detriment; for the other, the emotional component was key.

Change scores indicated that increases in breach were strongly related to increases in cognitive failure when baseline levels of each were controlled providing additional evidence that individuals' attentional resources are sapped when employers renege. The finding that cognitive failure was largely stable over time would suggest that breach affects people's attentional resources regardless of their trait-levels of cognitive failure.

The relationship of fulfilment to cognitive failure was not as expected. In both cross-sectional samples it was non-significant and in the longitudinal sample it was in the opposite direction: increases in fulfilment predicted increases in cognitive failure. The strength of the effect was almost as strong as for breach. There are three possible explanations: (1) changes in the employment relationship tax an individual's attentional resources regardless of whether those experiences are positive or negative; (2), the inducements were not sufficient to replenish those resources already expended; or (3), individuals also experienced breaches of their psychological contract and fulfilled obligations were not sufficient to counteract the ego depleting effects of coping with unfulfilled obligations. The diary study enables these explanations to be examined.

5.5.4 RQ2c. What is the relationship of violation with cognitive failure?

The relationship between violation and cognitive failure was positive in the cross-sectional samples. In the longitudinal sample, change scores were not significant. An experience of violation and cognitive failure co-occur, but do not seem to be causally related. Ego depletion theorists argue that negative affect will cause attentional decrements only when an individual has had to exercise self-control elsewhere (Baumeister et al., 1998). It would appear that not all individuals who experience violation have to exercise self-control and thus experience the

damaging effects on their attentional resources. The alternative explanation is that the time lag of six months is too great to detect changes and more proximal temporal measures of the two are needed.

5.5.5 RQ3a. To what extent does violation mediate the relationship of fulfilment and breach with outcomes?

Violation mediates the relationship between breach in all outcomes bar unhealthy behaviour in the cross-sectional samples and psychological well-being and unsafe behaviour in the longitudinal sample. Violation mediates the relationship for fulfilment in the cross-sectional samples only, although for all outcomes bar unhealthy behaviour.

AET's proposition that affect arising from events at work invokes behaviour (Weiss & Cropanzano, 1996) is consistently supported for breach in this study. As noted above, breach had non-significant direct relationships (X to Y path) with most outcomes, but predicted violation both cross-sectionally and longitudinally (X to M path). Violation had significant relationships that were negative for psychological well-being and pro-safe behaviours in the cross-sectional analyses and positive for unsafe behaviours in all analyses (M to Y path). The more an individual felt their employer had broken its promises, the more disaffected they felt and the lower their levels of well-being were. They were also less inclined to wear their PPE, to report accidents and to raise safety concerns. However, the absence of significant change scores suggests that these factors are not causally related, or if they are, the transitory nature of affect (Russell & Carroll, 1999) means that the time lag of six months is too long to capture these affect-behaviour relationships.

Surprisingly, in a safety-critical context, the mediated effect of breach on behaviour was stronger and more consistent for counterproductive than citizenship behaviours. In the longitudinal analyses, individuals' level of rule-violating increased the more aggrieved they felt; change scores indicated that a 1 standard deviation increase in breach resulted in a 10% increase in unsafe behaviour via violation. This finding would suggest that it is violation that is the key to explaining the withdrawal of safety behaviour; the effect of breach on rule-following behaviour is largely as a consequence of the experience of violation.

Fulfilment-behaviour relationships via violation were significant in cross-sectional analyses only. In the first sample, the indirect effect was of the same magnitude across behaviours, and was positive for well-being, safety compliance and safety citizenship towards one's colleagues and organisation. The effect was negative for unsafe behaviour in both data sets and strongest in the second group. The reduction in negative affect that fulfilment is associated with appears to have the effect of broadening individuals' affect-behaviour repertoires (Fredrickson, 2001,

2004) and thus facilitating their concentration and prosocial behaviour such as helping their colleagues. It also appears to decrease their willingness to take risks and shortcuts. However, an absence of significant change scores suggests that the cross-sectional findings are either coincidental or the beneficial effects of fulfilment on affect are cumulative in nature.

Lastly, the mediating role of violation in the context of unhealthy behaviours was inconsistent. In the first cross-sectional sample, fulfilment mediated by violation was positively associated with behaviours that put health at risk whereas breach was negatively associated with such behaviours. In the second and longitudinal samples the relationships were non-significant. Individuals do not appear to be engaging in distracting behaviour, such as smoking and drinking alcohol, as a result of the negative affect consequential to breach.

5.5.6 RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with outcomes?

Fulfilment does not predict cognitive failure in the cross-sectional studies and thus mediation analyses were not carried out. Conversely, cognitive failure did mediate the relationships between breach and all outcomes in the cross-sectional analyses. In the longitudinal sample, cognitive failure mediated the negative relationship between breach and safety compliance as well as safety citizenship towards one's colleagues and employer. The indirect relationships of breach for well-being, unsafe and unhealthy behaviour via cognitive failure were either non-significant indicating perhaps, the time lag is insufficient to detect these manifestations of self-control failure. Unexpectedly, in the longitudinal analyses, increases in fulfilment appeared to *reduce* not increase individuals' attentional resources resulting in reductions in safe behaviours.

Taken together, these results suggest that an ego depletion account can offer unique insights into the relationship of breach with outcomes. Experiences of breach are both associated with and predictive of reductions in individuals' attentional resources as measured through their cognitive failings. Reductions in attentional resources were in turn associated with reductions in an individuals' well-being and their capacity to control, communicate and intervene in risky situations. Such cognitive decrements were also associated with decrements in their capacity to resist the temptation to take short cuts and avoid unhealthy behaviours such as smoking.

The results in respect of fulfilment are puzzling. It is not entirely clear why an increase in fulfilment should predict an increase in cognitive deficit, other than to suggest, as others have (Guest, 1998), that the pressure to reciprocate generates a stress response. Alternatively, as argued by Conway and Briner (2009), the increases in fulfilment are technically a breach, and thus individuals respond to them as such. The diary study will enable this result to be confirmed or rebutted.

As a final test of ego depletion theory, the mediated relationship of breach on accident involvement via unsafe behaviour was examined in the cross-sectional samples. Longitudinal analyses were not conducted due to the low base rates normally associated with accident statistics (Zohar, 2000). It was deemed that a six-month time frame would be insufficient to detect any changes.

The indirect effect of breach on accident propensity via unsafe behaviour was significant for the first sample. The serial mediation of breach on accident propensity via cognitive failure and unsafe behaviour indicates that an employer's promise-keeping behaviour can have consequences for their employees beyond mere behavioural withdrawal.

5.5.7 RQ4a. To what extent does self-regulatory focus moderate the relationship of breach with violation and cognitive failure?

The self-regulatory focus of prevention-orientation moderated the effect of breach on violation for the first cross-sectional sample. Individuals who were more skilled at emotional control were able to avoid experiencing the emotional consequences of breach and reported feeling less frustrated and angry at their employer's transgressions. This finding was not repeated in the second cross-sectional sample. Furthermore, a prevention orientation did not moderate the effects of breach on attentional resources. However, the direct relationship of this self-regulatory focus demonstrated that individuals skilled in controlling their emotional responses were much less likely to experience violation and cognitive failures; the effect was replicated and of the same magnitude in both samples.

Production-oriented self-regulatory focus had no significant moderating influence on breach in respect of either individuals' experience of violation or their experience of cognitive failure. The direct effect of this self-regulatory focus was also non-significant.

Thus, it would appear that the direct effect of prevention-oriented self-regulation on motivation and attention is more important than its moderating effect and more important than a production-oriented focus. These findings are consistent with Wallace and Chen's (2006) proposition that the emphasis on prevention in a safety context shapes individuals' habitual responses. It would appear that what matters for the respondents in this study is how well they have learnt this emotional control response and not whether or not they have experienced high levels of breach.

5.5.8 RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with outcomes?

The moderation analyses for emotion-regulation strategy revealed that, overall, the type of strategy was more important for behaviour directly rather than its moderation of violation or cognitive failure. Two classes of strategy were examined, antecedent-focussed and response-focussed. The former heads of the emotional response so that it is weaker, the latter acts to suppress the emotional response or its display (Gross, 1998b). Effect sizes were considerably stronger for direct effects than interaction effects. However, moderating effects were also present and in line with predictions.

Taking the antecedent-focussed strategy first, individuals who employed more cognitive change strategies, such as trying to find humour in the situation, were able to reduce attentional failings and increase their capacity to act in an organisationally beneficial way, such as making suggestions to improve safety. In one of the two samples, individuals who deployed more of the antecedent-focussed strategy increased their capacity to comply with their safety responsibilities as well as the capacity to look out for the safety of their colleagues.

The effects of a response-focussed strategy, where individuals attempt to suppress or hide their emotions, were only evident in relation to unsafe behaviour. Individuals who experienced high levels of violation and employed this strategy were more likely to engage in behaviour that breaks safety rules. It is likely that this emotion regulation strategy served to maintain unpleasant levels of arousal associated with violation, which individuals would be keen to reduce (Gross, 1998a). However, it is not clear from these data whether the increased propensity for unsafe behaviour is motivated as an act of revenge or simply because the level of arousal is incompatible with following safety rules. Violation theory would suggest that it is motivated as an act of revenge (Morrison & Robinson, 1997; Restubog et al., 2015; Spector & Fox, 2002) whereas AET would favour the latter explanation. This effect is tested again in the diary study and is discussed in greater depth in Chapter 7.

5.6 Limitations and further research

The final section of this chapter considers the limitations of the study and considers how future research, including the diary study that follows, might address these issues.

Psychological contract theory (PCT) has at its very foundation the belief in the obligation to reciprocate and employees' free will to choose how to reciprocate (Rousseau, 1989, 1995). The proposition forwarded and tested was that individuals in safety contexts are constrained in

their ability to reciprocate and thus perceptions that their employer has breached the psychological contract would have minimal effects on individuals' behavioural intentions. However, it was also proposed that the inability to reciprocate broken promises would have greater consequences for psychological well-being as individuals with few options to rebalance their obligations inwardly direct their goal frustration. For fulfilment, it was ventured that reciprocation would continue as in other contexts and individuals would report good psychological health, exhibit pro-safe behaviour and desist from unsafe behaviour. This study extends the application of PCT to a safety context, but only found partial support for its propositions in respect of reciprocation. Fulfilment was associated with well-being but also unsafe behaviour. Breach was associated with unsafe behaviour and it was associated with poorer psychological health. However, it was also associated with greater organisationally directed citizenship behaviour.

Although two data sets were used to test the propositions, a survey can be susceptible to bias in estimates given individuals have to reconstruct from memory the ups and downs of their employment relationship, events which may have happened some time ago (Reis & Wheeler, 1991). These results may therefore be a reflection of memory limitations. The diary study samples psychological contract events on a daily basis reducing memory biases considerably. If these reverse relationships reoccur, then it would suggest a need to examine the assumption that fulfilment is beneficial and breach is detrimental where employees' behaviour is concerned.

Second, rarely are fulfilment and breach measured simultaneously. Generally, scholars examine either of the two constructs, not both. The assumption is that individuals have contracts that are on a continuum from fulfilled to breached, where the possibility exists that these states are not simply opposite in their effects. This study measured both fulfilment and breach and examined outcomes in the context of both. The measures were chosen to contain both open (fulfilment) and discrete (breach) aspects of the dynamic relationship, reflecting the fact that psychological contracts can contain elements that are in the process of being fulfilled (Turnley et al., 2003) as well as elements that have already been honoured or renegeged upon (Lambert et al., 2003). As is customary practice in psychometrics, reverse-scored fulfilment items were included to prevent response acquiescence (Nunnally, 1967). Although greater than threshold levels, these items did not load as high onto the breach factor as the breach questions. This may be substantive in that the two are conceptually distinct. Alternatively, it may be methodologically based repeating a common finding that reverse-scored items cluster into a separate factor (e.g. Carlson et al., 2011). In the diary study, breach and fulfilment are measured separately thus allowing their unique and combined influence on outcomes to be examined.

Thirdly, although this study adopted a longitudinal methodology, measures were only taken at two points in time. While this allows the direction of the change to be estimated, the addition of more time points would strengthen the design considerably and facilitate the study of the duration of effects (Pitariu & Ployhart, 2010). While a change score approach was deployed, phenomena such as affect are known to be transitory in nature, where individuals can start a day on a good mood and end it in a bad one (Miner, Glomb, & Hulin, 2005). A six-month time lapse is considerable and likely misses the responses contingent on the events themselves where affect is concerned. For cognitive failure, there is little research to guide a field study of this psychological phenomenon. Principally, it has been treated as trait measure of cognitive rigidity (cf. Wallace et al., 2002). Experimental studies of ego depletion have shown that the cognitive effects of self-control exertion can be witnessed within hours (e.g. Fischer, Kastenmüller, & Asal, 2012). Changes in breach over a six-month time span predicted changes in cognitive failure and changes in cognitive failure predicted changes in some behaviours, but not all. Thus, this too warrants investigating in the moment as well as over time. These considerations and limitations influenced the diary design, which studies these phenomena and their links with outcomes on a daily basis.

5.7 Summary

This study supports the proposal that the effects of fulfilment and breach on health and safety behaviour are best understood as a consequence of the motivational and attentional processes that arise when employees receive or fail to receive what they believe their employer is obligated to provide. When total effects were considered, the positive relationship of fulfilment with pro-safe behaviours was significant in 6 out of 8 estimates, the negative relationship of breach with pro-safe behaviours was significant in 4 out of 8 estimates, and the positive relationship of breach with unsafe and unhealthy behaviour was significant in 2 out of 4 estimates. The direct relationship between evaluations of the psychological contact and behaviour were largely as expected, but sometimes counter-intuitive. Fulfilment predicted well-being, but also unsafe behaviour and breach predicted prosocial behaviour. These findings suggest that the psychological contract is an important vehicle for understanding safety behaviour, but mediating mechanisms may be key to understanding individuals' behavioural intentions, particularly in respect of breach.

In respect of the AET perspective offered, this was consistently supported in cross-sectional analyses. Twenty-two out of 24 estimates of the indirect effects of fulfilment and breach on well-being, pro-safe and unsafe behaviours via violation were significant and in the direction

expected. Fulfilment and breach appear to impact individuals' motivation to behave safely via their influence on feelings of violation. The longitudinal results suggest that the relationship between perceptions of the psychological contract, affect and behaviour is most important in respect of well-being and unsafe behaviour; the changes in experience of violation arising from breach were significant and predicted decreases in well-being and increases in unsafe behaviour over the six months, which is a very important finding where individual and organisational health and safety is concerned.

EDT was also deployed to provide a unique insight into the cognitive effects of fulfilment and breach on safety behaviour. This study supports the notion that breach has consequences for individuals' attentional resources, which in turn are related to individuals' capacity to behave safely, their ability to desist from unsafe behaviour, and their ability to exercise self-control over behaviour choices that affect health. All 12 of the indirect effects of breach on well-being, pro-safe, unsafe and unhealthy behaviour via cognitive failure were significant and in the direction expected. When the effects of violation are included, the negative consequences of breach for individuals' capacity to behave safely and avoid unsafe behaviour would appear to increase.

Longitudinal results supported the idea that managing the depleting effects of breach robs individuals of the capacity to perform their safety responsibilities and protect the safety interests of their colleagues and their employer. However, these results did not indicate that self-control failure was in evidence; the relationship of changes in cognitive failures to unsafe and unhealthy behaviour was non-significant. It would appear that mood might matter more for unsafe behaviour than self-control strength; having the energy to resist taking short cuts is more important than having the mental strength.

Fulfilment did not appear to have a beneficial effect on individuals' attentional resources and might even be a drain on them. Fulfilment's relationship to cognitive failure was non-significant in the cross-sectional analyses. In the longitudinal analyses, it would appear to act like breach; the more an employer exceeded individuals' expectations over the time lag, the more attentional lapses they reported and the less frequently they made a positive safety contribution. This would appear to support the idea that over fulfilment is technically a breach (Conway & Briner, 2009) and thus also detrimental to individuals, although complacency cannot be ruled out.

The study supports the proposition that psychological contract theory is an important vehicle for understanding the full range of safety behaviours, from safety compliance through safety to citizenship to counterproductive behaviour that undermines safety. This study also endorses research that indicates that employers' promise-keeping behaviour has important

consequences for employees' psychological health and extends it to an understanding of their behavioural choices that affect their physical health.

Chapter 6. A diary study of psychological contract events and safety behaviour

6.1 Introduction

This chapter presents a fourteen-day diary study that examines the relationship between psychological contract events, motivational and attentional experiences, and safety behaviour at the within-person level.

The primary aim of the study was to examine the unfolding nature of the psychological contract and the consequences of daily positive and negative workplace events for individuals' affect, attention and safety behaviour. Secondly, it explores the extent to which motivation (violation) and attention (cognitive failure) mediate the relationship between psychological contract events and safety behaviour. In so doing, its aim was to establish whether AET or EDT better explain how the zone of acceptance operates. Finally, the study considers how individuals' emotion-regulation strategy moderates their experience of violation and cognitive failure, and the influence of these on their behaviour.

This chapter proceeds in the following manner; it presents, (1) a brief overview of the diary method; (2) a rationale for using the diary method; (3) hypotheses to be tested; (4) results of multi-level modelling; and, (5) conclusions and limitations of the study.

6.2 Research design

This section describes the research design employed in this study. It introduces the reader to the daily-diary method and gives reasons for its choice in the context of this research. The section concludes by considering the limitations of a diary methodology.

6.2.1 Overview of the diary method

Quantitative daily-diaries are a relatively recent phenomenon in field settings. Their use has not supplanted questionnaire surveys, but their use in organizational research is growing (Beal & Weiss, 2003, p. 1). Csikszentmihalyi, Larson, and Prescott (1977) are accredited as having conducted the first diary study leading some to suggest that they have "revolutionized" psychological research (Iida, Shrout, Laurenceau, Bolger, & Cooper, 2012).

A diary study's primary appeal is it allows for the exploration of day-to-day or moment-to-moment intra-individual variations in psychological experiences and behaviour. They also afford researchers the opportunity to study the stability and volatility of psychological phenomena (Alliger & Williams, 1993), to see if states change and whether they decrease or increase over time; for example, studies have revealed that personality traits (Côté, Moskowitz, & Zuroff, 2012) and work behaviours (Miner et al., 2005), generally thought to be stable over time and between-persons, actually exhibit considerable within-person variation.

The objective of a diary study is to capture the response of the individual as close in time to the phenomenon of interest as well as capture experiences and behaviours enacted in the real world rather than the laboratory (Ohly, Sonnentag, Niessen, & Zapf, 2010) thereby giving them greater ecological validity than experimental studies (Larson & Almeida, 1999). Three principal types are employed: experience-sampling (ESM), event-sampling and interval-sampling, although diaries that include interval as well as event-related observations are used (cf. Miner et al., 2005) and can strengthen a design considerably (Bolger, Davis, & Rafaeli, 2003).

ESM involves signalling to individuals to respond at random intervals through an electronic device (Beal & Weiss, 2003). In a safety-critical context, the signal's alerting nature could distract the respondent from their task with disastrous consequences and thus ESM is deemed inappropriate for this research.

Event-contingent diaries are designed to capture specific occurrences that are of particular interest, such as psychological contract events, that might be missed with the other diary types. Furthermore, they enable the unfolding nature of the event to be captured, which is deemed a major strength (Bolger et al, 2003) and thus the reason for its choice in this study. Collating event-contingent information avoids the need for individuals to summarise their multiple experiences over weeks and months to arrive at a response such as they might be asked to do in a cross-sectional study, typical of psychological contract research (Conway & Briner, 2005).

Interval-sampling involves collecting responses on a regular, predetermined and theoretically meaningful basis, such as the end of the working day (Reis & Gable, 2000). Typically, dairies are collected daily over a period of two weeks (DeLongis, Hemphill, & Lehman, 1992). Recording responses at regular intervals means that the fluctuations in perceptions, mood, attention and behaviour can be recorded over time and in the absence of an event. The cognitive load on the individual is reduced, as he or she does not have to remain vigilant and judge whether or not they should record their experiences. In comparison to questionnaires, where perhaps the most salient rather than the typical experience is remembered, interval diary studies reduce the impact of such memory biases by asking respondents to record their experiences of interest

regularly (Reis & Wheeler, 1991). Furthermore, through the aggregation of daily experiences, a diary study can portray a picture of between-person as well as within-person variability without the measurement error that results from reconstructed memories (Beal & Weiss, 2003). Accordingly, this diary study employs both interval- and event-sampling.

6.2.2 Rationale for a diary study

Diary studies are underutilised in psychological contract research and perhaps their value has been overlooked. This section examines the rationale for their use and the benefits they can bring to the study of psychological contracts and safety behaviour.

Diary studies have been used to examine a range of phenomena related to this research, such as how social comparisons influence citizenship behaviours (Spence, Ferris, Brown, & Heller, 2011), how daily stresses and strains relate to well-being (Totterdell et al., 2006), and how workday behaviours are related to emotional experiences (Glomb, Bhava, Miner, & Wall, 2011). However, the diary methodology's use in psychological contract studies is rare, and its use in safety studies would appear to be non-existent; no diary studies other than those that examine psychosocial safety climate could be found (cf. Garrick et al., 2014).

Conway and Briner (2002) utilised a daily diary to study the emotional consequences of exceeded and broken promises and Griep, Vantilborgh, Baillien, & Pepermans (2015) used a weekly diary to establish the relationship between breach, violation and counterproductive work behaviour in volunteers. However, both studies look at direct effects of predictors on outcomes, but not the intermediary effects of motivation or attention on behaviour.

Regrettably, the preponderance of psychological contract and safety studies are cross-sectional in nature, although sometimes longitudinal, and thus many questions remain regarding the frequency of events, the nature and extent of the reaction and, the implication of the reactions for the stability of safety behaviour.

The dynamic nature of psychological contracts is not well understood due in part to the fact that the method of choice continues to be a cross-sectional questionnaire (Conway & Briner, 2005). The first advantage of diary studies over cross-sectional research is that they examine these processes as they occur, capturing minor as well as major events, positive and negative events, that characterise the ebb and flow of daily work life (Conway & Briner, 2005). Individuals can experience positive *and* negative workplace events on the same day or on successive days. Thus individuals may have multiple good and bad experiences over time, the sum total of which may be positive overall or negative overall (Duffy et al., 2002). Without registering events as they occur, the strength of the impact of one type over the other is difficult to determine, as is the consistency or variability of individuals' responses to those events.

Whereas, questionnaires can report on attitudes that may be the sum of multiple affective experiences at work over months or years (Weiss & Cropanzano, 1996), they cannot report on the individual events and the transient moods, emotions or behaviours that accompany them (Conway & Briner, 2005). The second benefit of diary studies therefore, is that they can capture these transient states or behavioural episodes that would otherwise be lost in the melee of experiences.

Thirdly, as noted earlier, work behaviour demonstrates significant within-person variation (Miner et al., 2005). Individuals do not always perform work behaviours continuously during the course of a day (Beal et al., 2005). Furthermore, individuals can engage in productive *and* counterproductive behaviours over time, the culmination of which can be a positive contribution or a negative contribution to the organisation (Dalal et al., 2009). Safety behaviour has not been examined on a day-to-day basis, having been largely conceived of as a between-person phenomenon and thus stable over time (cf. Christian et al., 2009). Employing a diary-study approach will enable this belief to be refuted or affirmed and to test whether safety behaviour is susceptible to daily changes in affective and attentional experiences that arise from psychological contract events.

Finally, diary studies allow for inferences regarding cause and effect (Bolger et al., 2003) not possible in single-shot questionnaires. While these inferences may be weak in comparison to experimental studies, as already noted, they are likely to produce results that are more ecologically valid.

6.2.3 Problems with diary studies

Diary studies are not without their limitations. There are three problems that pose a concern for this study.

The first and main problem is the commitment and demand placed on diary respondents. Although the overall time commitment may be no more than in a survey design, because respondents are asked to make several entries over many days, they may perceive the commitment as burdensome (Beal & Weiss, 2003). Consequently, sample sizes for diary studies are often small. However, Maas and Hox (2004) assert that a minimum of 30 participants can be sufficient for subsequent multi-level analyses.

Secondly, Larson and Almeida (1999) report that response compliance may become an issue when making entries interferes with an individual's daily routine, or when individuals have had a particularly stressful day. Thus, they argue, events may not be recorded, or those that are may be unrepresentative. DeLongis et al., (1992) review the subject of attrition and missing data and

suggest that we need not be too pessimistic; compliance rates are likely to be quite high, and in the order of 80%. Furthermore, they suggest that researchers can reduce the risk through detailed instructions and encouraging messages to participants through the course of the study.

Finally, reactance may be of concern whereby the participant's behaviour changes as a consequence of taking part in the study (Bolger et al, 2003). Once again, this threat to validity of may be more apparent than real. Bolger and colleagues report an unpublished study that showed the effect may be short-lived (e.g. Gleason, Bolger, & Shrouf, 2001). A published study by Litt, Cooney, & Morse (1998) showed that an increasing awareness of one's behaviour did not alter the relative frequency with which the behaviour was reported when compared to that of non-diary participants.

In conclusion, the diary methodology, while having its limitations, offers much to the researcher wishing to study events and the unfolding experiences and behaviours that accompany them, phenomena that cannot be gleaned from a survey design.

6.3 Research framework

6.3.1 Introduction to the research framework

This study addresses the following questions, reproduced here from Chapter 4:

RQ2a. What is the relationship of fulfilment and breach with motivation violation?

RQ2b. What is the relationship of fulfilment and breach with cognitive failure?

RQ2c. What is the relationship of violation with cognitive failure?

RQ3a. To what extent does violation mediate the relationship of fulfilment and breach with outcomes?

RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with outcomes?

RQ4a. To what extent does emotion regulation strategy moderate the relationship of breach with violation and cognitive failure?

RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with behaviours?

The diary study builds on the survey reported in Chapter 5. It seeks to establish whether the findings at the between-person level are replicated at the within-person level. Where the

survey was interested in global perceptions of fulfilment and breach of obligations, the diary is interested in discrete events that signal the employer’s breach or fulfilment of its commitments. Figure 6.1 outlines the model along with the research questions.

6.3.2 Hypotheses

This section describes the research hypotheses regarding the unfolding psychological contract.

The primary aim of this research is to use psychological contract theory to explain the on-going variation in employees’ safety behaviour. In relation to the first question, the main consideration is whether individuals react to events that signal under-and over-fulfilment of their psychological contract with increases or decreases in their safety behaviour. The arguments forwarded here are essentially the same as for the survey; namely, violation and cognitive failure mediate the relationship between breach, fulfilment and safety behaviours through their impact on motivation and attention. The distinction in this study is it moves the focus from the attitudinal level (between-person) to the event level (within-person). The conceptual reasons for doing this are now discussed.

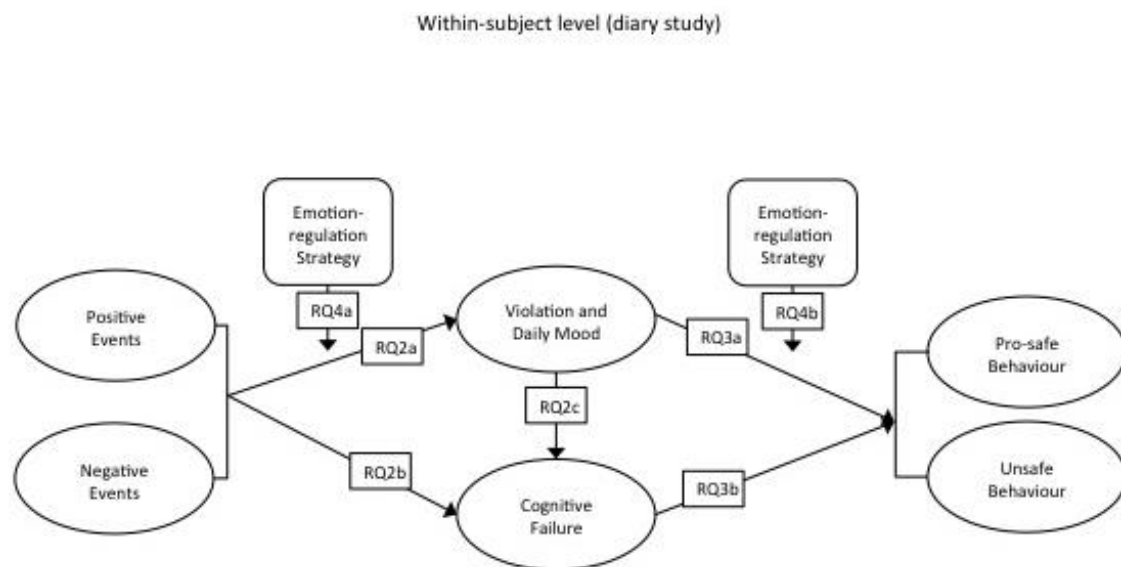


Figure 6.1 Hypothesised model and associated research questions at the within-person level.

Psychological contract event

First, as discussed in the foregoing, psychological contracts are in the “eye of the beholder” (Rousseau, 1995) and thus highly idiosyncratic. The survey prompted the participants to respond to a widely drawn and context-relevant set of obligations, but this list could never capture all individuals’ concept of their psychological contract. Additionally, the manner in

which respondents amalgamate the different types of events and aggregate their experiences to arrive at an answer on the extent to which their employer has met its obligations to them is very unclear. In this study, individuals are allowed to choose whether the events they encounter on a daily basis constitute breach or fulfilment of their psychological contract. Applying Ohly & Schmitt's (2013) taxonomy of workplace events, an event is defined as a communication from, an interaction with, or an observation of an action to someone in the individual's organisation. A negative event is where the employer or someone acting on its behalf *fails to meet / falls short* of its commitments or obligations. A positive event is where the employer *exceeds* its commitments or obligations. Thus, responses are to personally relevant situations, which are clearly located in time and that individuals do not have to reconstruct from memory. This should therefore reduce the error in measurement. Both positive (over-fulfilment) and negative (breach) events are recorded, where they occur, and thus it is also possible to establish the manner in which events interact to influence mood and behaviour and how they combine over time to influence outcomes.

Events and affect

Workplace events that signal the organisation's performance on its commitments are now thought to be responsible for changes in behaviour through their impact on individuals' affect (e.g. Briner, 2000; Conway & Briner, 2009; Guerrero & Herrbach, 2008; Weiss & Cropanzano, 1996; H. Zhao et al., 2007). Well-rehearsed arguments suggest that affect and behaviour are not temporally stable (cf. Beal et al., 2005; Weiss & Cropanzano, 1996), yet, a major impediment to the understanding of the relationship between unfolding psychological contract events and employees' affect and behaviour is the reliance on between-person designs. On account of their fleeting nature (Russell & Carroll, 1999), the emotional and attentional consequences of events can only be reliably measured through techniques that capture these momentary experiences as and when they happen (Bolger et al., 2003).

Research was also presented that explores the "negativity effect" (Kanouse & Hanson, 1971) where behavioural adaptation ensures people attend more to harmful situations and people behaving badly than to benign situations and people behaving well (Baumeister et al., 2001; Peeters & Czapinski, 1990). Evidence exists to show that the relationship between positive and negative events and affect is not linear, as cross-sectional studies would suggest. Bad events are stronger than good in many spheres of life and in terms of their consequences for individuals (Baumeister et al., 2001) and positive events are not necessarily able to buffer the effects of negative events (Ohly & Schmitt, 2013).

Although diary studies have found that broken and exceeded promises account for a significant amount of variation in negative and positive emotional reactions (Conway & Briner, 2002), this study goes further and studies affect-behaviour relationships rather than the customary attitude-behaviour relationship (e.g. Griep et al., 2015).

The prominent events described in psychological contract theory are the moments when an employee realises that his or her employer has exceeded, fulfilled or reneged on its commitments. It is that moment in time when an individual learns that they have or have not been recommended for promotion; learns that the much-needed support from management at a difficult time is or is not forthcoming; or, learns that the commitment to provide high quality safety equipment has or has not been honoured. Invoking AET enables the proposition to be tested that it is the affect inducing properties of these psychological contract events that relates them to behaviour. Thus, in line with AET the following hypotheses are made at the within-person level:

H1a Breach events negatively predict and over-fulfilment events positively predict pleasant mood

H1b: Breach events positively predict unpleasant mood and violation whereas over-fulfilment events negatively predict each

Events and attention

Turning now to the attentional consequences of psychological contract events, as explained in the previous chapter, there are also good reasons to expect that breach and over-fulfilment will relate to behaviour through their effect on an individual's cognitive resources. Invoking Ego Depletion Theory (EDT; (Muraven & Baumeister, 2000), it was demonstrated at the between-person level that there was an indirect effect of breach on safety behaviours through cognitive failure. The propositions forwarded here are essentially the same as the survey; namely, the ego depleting demands of coping with stress and controlling the aversive emotions that arise following breach reduce an individual's attentional capacity to engage in pro-safe behaviour and avoid unsafe behaviour. In respect of positive events, we might expect, in line with a "broaden and build" perspective (Fredrickson, 2001), that positive mood states arising from over-fulfilment will enhance individuals' attentional resources.

This study expands the findings in the survey to examine the stress inducing and mood altering effects of breach and over-fulfilment on cognitive failure at the within-person level. Individuals report on a daily basis the extent to which they have experienced cognitive failure, as well as the transient mood states that are posited to explain how breach and over-fulfilment events are

related to behaviours. This allows for a more robust test of the theoretical model because it examines these transient states as and when they occur. Thus, in line with EDT the following hypotheses are made at the within-person level:

H2a Breach events positively predict and over-fulfilment events negatively predict cognitive failure

H2b Violation and unpleasant mood mediates the positive relationship between breach events and cognitive failure.

H2c Pleasant mood mediates the negative relationship between over-fulfilment events and cognitive failure.

Affect and behaviour

The second guiding research question is concerned with the consequences for behaviour of the affect arising from psychological contract events. As already stated in previous chapters, the central tenet of the motivation pathway is that events, such as breach, trigger emotions whose role it is “to energise the individual physiologically and to induce appropriate action...that will reduce negative feelings and enhance positive feelings” (Spector & Fox, 2002, p. 273).

Moreover, the contention is that the motivation to improve bad moods will be much stronger than the motivation to sustain a good mood (Grandey, 2003; Gross, 1998b). Thus we might expect stronger relationships between violation, unpleasant mood and behaviours than between pleasant mood and behaviour.

Very little research exists that examines the relationship between psychological contract events, *state* mood and *state* behaviour. Nevertheless, at the between-person level, there are good reasons to believe that psychological contract events are important sources of strain (cf. Chambel & Oliveira-Cruz, 2010; Gakovic & Tetrick, 2003; Spector & Fox, 2010), that violation and citizenship behaviours are associated (Zhao et al., 2007), that individuals who experience violation are motivated to take revenge and engage in counterproductive behaviour (Bordia et al., 2008; Restubog et al., 2015), but may not act in ways detrimental to their in-role performance (Suazo, 2009; Suazo & Stone-Romero, 2011).

However, there have been contradictory findings in research at the within-person level; the affect-behaviour relationship can be counter-intuitive (for a meta-analysis, see Shockley, Ispas, Rossi, & Levine, 2012), with positive mood states failing to predict OCB (cf. Miner & Glomb, 2010), with negative mood states predicting pro-social behaviours (Glomb et al., 2011; Trougakos, Beal, Cheng, Hideg, & Zweig, 2015), as well as intuitive findings with negative mood states predicting counterproductive behaviours (cf. Dalal et al., 2009). Miner et al (2005, p.

176) explain that at the event level, a person experiencing a negative mood as a result of work tasks may withdraw to find relief resulting in a more positive mood. At the between-person level, those individuals who experience negative moods more often will report more frequent withdrawal. Thus we might expect the size and even the sign of the relationship to be different at different levels of analysis.

This study goes further than the survey and examines the contention that behaviours are often evidence of an individual's motivation to sustain or achieve positive affect (Naylor et al., 1980). In line with AET and an emotion-centred model of work behaviour, the following hypotheses are presented

H3a Violation and unpleasant mood mediate the negative relationship between breach events and safety behaviour

H3b Violation and unpleasant mood mediate the positive relationship between breach events and unsafe behaviour

H3c Pleasant mood mediates the positive relationship between over-fulfilment events and safety behaviours

H3d Pleasant mood mediates the negative relationship between over-fulfilment events and unsafe behaviour

Attention and behaviour

A previous chapter (chapter 5) presented experimental studies that have shown that individuals who are instructed to control emotions, thoughts, attention, choice and volition suffer significant losses in self-control strength (Hagger, Wood, Stiff, & Chatzisarantis, 2010), and others have shown that gains in self-control strength accrue when individuals experience positive affect (Tice et al., 2007). Whereas these studies are robust tests of cause and effect, their ecological validity is less sound given the contrived nature of the tasks that the individuals are required to perform. However, on account of the complexities of studying state affect-behaviour relationships (Miner & Glomb, 2010), and the difficulties studying momentary, unconscious cognitive processes (Hockey, 1993), there are very few field diary studies of the effects of emotional control on self-control strength and behaviour. I could find none that deploy psychological contract theory.

Nevertheless, in a series of experience-sampling studies that examined emotion regulation and behaviour, Beal, Trougakos and colleagues (Beal, Trougakos, Weiss, & Dalal, 2013; Trougakos et al., 2015) demonstrated in their 2013 study that regulating one's emotions leads directly to strain and subsequently to fatigue. In their 2015 study they found suppressing one's emotions

relates to exhaustion and indirectly to the reduction in citizenship behaviour towards colleagues, but not in-role activity. Trougakos et al (2015) accounted for these findings by suggesting, after Hobfoll (1989, 2001), that people are motivated to be strategic in their conservation of resources and deploy their efforts away from OCBI to on-task behaviours, because the latter are more likely to be sanctioned by supervisors. Although they presented OCBI withdrawal as evidence of motivational factors at work, they operationalised motivation as exhaustion, not as affect. In this study, both attention and motivation are operationalised separately, the former as cognitive failure and the latter as violation. Thus it is possible to establish whether motivation or attention is responsible for the diversion of resources from one aspect of performance to another.

In keeping with an ego depletion perspective, this study maintains that when an individual is subject to strain arising from breach events, her or his attention will be diverted to process the emotions generated by the event. Thus, the efforts to maintain emotional equilibrium will result in reduced cognitive resources to maintain attention on task performance. When individuals experience violation, the efforts to manage their negative affect will deplete their self-control resources and individuals will exhibit signs of cognitive failure and concomitant performance decrements. Attention and self-control will be diverted away from discretionary behaviours in order to preserve attention on in-role safety behaviours. Where resources are significantly depleted, individuals will start to exhibit self-control failure, operationalised as cognitive failure, and engage in high-risk strategies in the form of unsafe behaviour as well as experience decrements in in-role safety behaviour. Where over-fulfilment events are experienced, the positive affect will replenish resources and enable individuals to concentrate their attention on their safety tasks.

H4a Cognitive failure mediates the negative relationship between breach events and safe behaviour

H4b Cognitive failure mediates the negative relationship between violation, unpleasant mood and safe behaviour

H4c Cognitive failure mediates the positive relationship between violation, unpleasant mood and unsafe behaviour

H4d Cognitive failure mediates the positive relationship between pleasant mood and safe behaviour

Moderating effects of emotion regulation strategy

The fourth and final research question guiding the diary study is concerned with the moderating effects of an individual's emotion-regulation strategy. As discussed earlier, there is growing appreciation that individuals differ to the extent that they can "keep their cool" (Gross & John, 2003; Richards & Gross, 2000). A consensus is developing that people can choose which emotions they display and when (Gross, 1998b). Yet in research studies, there appears to be little recognition of the fact that individuals may use different strategies in different circumstances and thus may exhibit considerable within-person variation in their emotion regulation.

Gross and John's study of individual differences in strategy was based on the premise that "specific emotion regulation strategies can be differentiated along the timeline of the unfolding emotional response" (2003, p. 348). Whereas they tested the proposition that individuals who habitually deploy different strategies between the event and their response have different outcomes, this study conceptualises emotion regulation strategy as a within-person phenomenon. Thus, instead of examining "if people... then" relationships, the daily diary examines "when people...then" relationships. For example, when individuals choose an antecedent focussed strategy, such as cognitive reappraisal, they head-off the emotional response and maintain their capacity to perform safety behaviour.

On the other hand, when they use a response-focussed strategy, such as suppression and pretend they are in a good mood, their unpleasant mood will remain intact. As they try to keep the lid on their bad feeling, they will use precious cognitive resources (Gross & John, 2003). Thus, by implication, we might expect the emotion-regulation strategy to interact with both the experience of violation and cognitive failure as well as the consequences of the same on behaviour. Thus,

H5a Deployment of an antecedent-focused emotional regulation strategy dampens the negative consequences of a breach event on violation and cognitive failure.

H5b Deployment of a response-focused emotion regulation strategy exacerbates the negative consequences of a breach event on violation and cognitive failure.

H6a Deployment of an antecedent-focused emotional regulation strategy dampens the negative behavioural consequences of violation and cognitive failure.

H6b Deployment of a response-focused emotion regulation strategy exacerbates the negative behavioural consequences of violation and cognitive failure.

6.4 Method

6.4.1 Sample

Participants in the diary study were volunteers from Company A, who had previously taken part in the survey and who had indicated their willingness to participate in the diary study. Forty-six participants volunteered to take part in the diary immediately following the first administration of the survey and another 20 participants volunteered after the second administration of the survey; a total of 66 individuals. 128 participants from Company B also volunteered to take part. However, data transmission costs to and from the ships were prohibitive and thus the company declined the diary part of the study. Fifty-seven volunteers from Company A went on to complete at least one diary entry. The data set contained on average 9.16 diary entries per person out of a possible 14. However, in order to assess change, at least 3 data points are required (Pitariu & Ployhart, 2010). Therefore, data from 6 participants were removed as they had completed less than 3 entries. A further participant's data was removed, as they had not followed instructions for diary completion.

Fifty respondents contributed diary entries of more than 3 day's duration amounting to 458 diary days in total. Ages of volunteers ranged from < 20 to between 60 and 69 with the median age group 30 to 39. The respondents were spread across roles in the following proportions: 21.6% were deck officers; 15.7% were engineer officers; 15.7% were deck crew; 13.7% were managers, and 9.8% were crew from the engineering and catering departments. Twelve (23.5%) did not report their job role.

6.4.2 Procedure

Following a pilot diary administration, the diary data were collected on two occasions immediately after each administration of the survey. The diary was administered electronically using the Qualtrics online tool to all volunteers on-board Internet-enabled ships and via an Excel spreadsheet for those on other types of ship. An email was sent to all respondents with detailed diary instructions prior to the first diary entry. The instructions explained the context of the study, its relationship to the survey and what respondents should do if they forgot to make an entry. The first day's entry of the online version of the diary and the first sheets of the Excel version contained a confidentiality statement and detailed examples of the types of positive and negative psychological contract events they might report in their diaries.

On each subsequent day of the diary, the online respondents were emailed a unique anonymous link for that day's entry. Respondents were working on-board ship around the world in different time zones and thus invitations to complete the diary were sent automatically at 00:01.

They could choose whether or not to review explanatory and confidentiality information again and were instructed to complete the diary at the end of the working day or at the end of their last shift (all individuals except the managers worked two shifts per day).

In the Excel version, respondents were emailed two anonymous files containing diary entry sheets for 7 days each. Information regarding confidentiality, examples and instructions were contained in the first few sheets of the files. Conditional formatting and hidden sheets concealed the diary responses. Respondent-generated codes enabled diary entries to be matched.

Individuals were requested to complete the daily diary even if no events occurred, as there were sections that needed to be completed every day. A 'thank-you' email was sent to each respondent each day of the diary they completed. An extended email conveying the researcher's gratitude and the importance of their contribution was sent when they had completed 7 days of entries and again when they had completed 14 days of entries.

6.4.3 Measures

Daily diary measures recorded every day

Control variables

The day of the week that the diary was completed, the diary day (i.e. 1, 2, 3...14) and the time of day the diary was completed were included as control variables.

Daily mood

To study the cumulative effects that daily psychological contract events have on psychological well-being as well as the extent to which mood states influence the interpretation of psychological contract events, the same twelve adjectives from Warr's (1990) measure of job-related affect as were used in the survey were presented to participants. Individuals were requested to indicate how they had felt overall at work that day assessed against Warr's list of adjectives on a scale of 0 (never) to 5 (all of the time). Factor analyses confirmed a two-factor model of pleasant and unpleasant mood, each containing 6 items. Internal reliability estimates were $\alpha = .91$ for pleasant mood and $\alpha = .75$ for unpleasant mood.

Psychological contract violation

Individuals' affective reaction was measured daily by two items of Robinson and Morrison's psychological contract violation measure. The wording was adapted to focus respondents' attention on how they felt about their employer that day. Respondents indicated their

agreement with statements such as, "Today, I felt extremely frustrated by how I have been treated by my employer" on a scale of 1 (strongly disagree) to 5 (strongly agree).

Cognitive failure

Wallace et al.'s CFQ (2002) was used to assess daily levels of ego depletion. The CFQ is an adaptation of Broadbent et al.'s original measure of cognitive failings in everyday life (Broadbent, Cooper, FitzGerald, & Parkes, 1982). Whereas both versions of the CFQ have been used as a trait measure, Broadbent et al. observed that their original measure might be sensitive to a temporary state of cognitive malfunction related to occupational stresses (p. 3). Thus, in the absence of a daily measure of cognitive failure or guidance on the within-person variability of the construct, nine items from Wallace et al.'s CFQ (2002) were chosen to reflect state levels of ego depletion; 3 items each from the memory failures, distractibility and blunders dimensions. The wording was adapted to reflect daily occurrences of *Forgetting* "Did you forget to do something you said you would?" *Distractibility*, "Did you have trouble making up your mind?" and, *Blunders*, "Did you lose your temper and regret it?" In order to reduce the cognitive load on respondents, the response options were reduced to "yes" or "no" following the stem question, "Please indicate if the following happened to you at work today". The alpha estimate of reliability for the six-item scale was $\alpha = .62$.

Psychological contract events

To record the type, polarity, and frequency of daily fluctuations in the employment relationship, the participants were asked to indicate whether they had experienced a negative event or a positive event that day and to provide some details of the event. Participants were given examples of each that had been derived from the earlier interviews and focus groups. For example, "The agent comes out on a launch to deliver the spares you urgently need despite your late order" (a positive event) and, "The promise of better quality PPE has not been honoured" (a negative event). Respondents were asked, "Have you experienced a negative event today where your employer or someone acting on behalf of your employer failed to meet / has fallen short of its commitments or obligations to you?" and asked to indicate "yes" or "no". They were also asked "Have you experienced a positive event today where your employer or someone acting on behalf of your employer has exceeded its commitments or obligations to you?" and asked to indicate "yes" or "no".

Outcomes

Irrespective of whether individuals reported an event, they were asked to record their safety behaviour. For safety behaviours, the same measures of safety compliance, citizenship and

unsafe behaviour used in the survey were again employed. Items were considered for inclusion on the basis that they were likely to vary on a daily basis. 8 safety compliance items, 6 safety citizenship items (3 SCBI and 3 SCBO), and 3 unsafe items (USB) were included. For example, safety compliance items likely to vary on a daily basis included “I used the correct PPE for the job”, but not, “Contact the DPA / shore-side management if prevented from ...exercising my rights...” All behavioural items were to be rated on a scale of 1 (not at all) to 7 (to a very great extent). For the pro-safe behaviours, individuals were also given the option to indicate “N/A” where the opportunity to perform the activity did not present itself. These observations were recorded as missing data in subsequent analyses. The internal reliability estimates for the scales were as follows: safety compliance $\alpha = .96$; SCBI $\alpha = .85$; SCBO $\alpha = .91$; and USB $\alpha = .99$.

Moderator

Participants were asked to report which emotion regulation strategies they had used during the day by responding “yes” or “no” to the list of 13 strategies presented. The same strategies described in the survey were included, such as, “Pretended I am in a good mood”. Factor analyses confirmed two dimensions of antecedent-focussed (A-ERS) and response-focussed emotion regulation-strategy (R-ERS). As with the survey, situation selection items failed to load sufficiently on either dimension. Two response-modulation strategies also failed to load onto either dimension. These four items were dropped. Subsequent Cronbach alphas for the two scales were; A-ERS (5 items), $\alpha = .76$; and, R-ERS (4 items), $\alpha = .69$.

6.4.4 Analytic strategy

The diary study contains data from 50 study participants recording 458 daily diary entries. As such the data are structured into two levels; measurements at the daily level (Level 1) were nested within participants (Level 2). Failing to recognise the hierarchical nature of the data leads to interpretational and statistical errors (Tabachnik & Fidell, 2013). However, the focus in this chapter is on within-person effects as between-person effects are reported at length in the survey study in the previous chapter.

Each participant provided at least three diary-days of data. Participants recorded breach and fulfilment events, violation, cognitive failure, pleasant and unpleasant mood, safety compliance, safety citizenship towards their colleagues, safety citizenship towards their organisation and unsafe behaviours on a daily basis (Level 1). These data were aggregated to the person level (Level 2) and mean responses recorded for each individual on each variable. Consequently, the data require statistical methods such as Multi-level modelling (MLM) that can partition the variation in the responses into the levels. MLM is a type of multiple regression that allows the

researcher to separate out the within-person (Level 1) from the between-person (Level 2) variation in data and examine relationships between predictor and outcome variables at a person level and a day-to-day level and across levels. MLM was performed using the SPSS v.22 MIXED computer programme (IBM, 2013).

Given these data also have time dependencies: responses at Time 1 are likely to be dependent or related to responses at Time minus 1 (Beal & Weiss, 2003), the day of response for the entry was entered as a control. Person-level predictor variables were aggregations of the day-level data. Within-person predictor variables were centred on the respective person mean; i.e. the person mean was subtracted from each day's observation. This procedure avoids issues associated with multicollinearity, facilitates model fitting (Stride, 2008) and enables the variability of individuals' perceptions, feelings and behaviours over the days of the study to be separated from the between-person differences of all 50 participants. This is referred to as "centring within context" (Kreft & de Leeuw, 1998) and prevents the confounding of between-person and within-person variation.

6.5 Results

Table 6.1 provides means, standard deviations, ICC(1) values for dependent variables, and between- and within-person correlations for all study variables. There were 458 diary days of data during which time 81 positive and 84 negative events were reported. Individuals experienced on average 1.62 positive and 1.71 negative events each over the period of the study. An example positive event is, "*The vessel has changed flag of registry and we have signed a new contract with the same salary.*" An example negative event is, "*The ... office forgot to enlist me and my family to a health insurance that was always given to every seafarer working onboard company vessel...*"

There was wide variation in the number of events per person (positive event $SD = 2.44$; negative event $SD = 2.41$). Fifty-three per cent of individuals reported at least one negative event, 48% at least one positive event and 22% of individuals recorded days where both positive and negative events were experienced. Thirty-seven per cent of individuals who responded reported neither a positive nor a negative event over the course of their diary completion.

6.5.1 Variability of daily measures over time

Before reporting the results of hypothesis testing, statistics regarding the variability (or stability) of behaviours over the course of the diary study are presented. A separate null model was run for each outcome variable; null models provide estimates of the grand mean (the

intercept) and within-person variability (the residual). Separate unconditional models were also run for each outcome variable. An unconditional model includes a random component and indicates the extent to which the intercept varies by individual and thus gives an indication of the between-person variability. These basic models do not have any predictor variables entered and thus they provide baseline parameter estimates from which model improvement can be assessed.

Partitioning between- and within-person variation

From the unconditional model, the extent to which the data are clustered within persons is determined (ICC [1]). The ICC (1) signifies the amount of variance attributable to differences between people (Bryk & Raudenbush, 2002). In practical terms, this measure signifies the extent to which people are consistent, but different from one another. Table 6.1 indicates that 62 per cent of variance in psychological contract violation (PCV), 73 per cent in cognitive failure (CF), 78 per cent in positive affect (PA) and 62 per cent in negative affect (NA) are attributable to between-person variation in these variables. For the behavioural variables, 71 per cent of variance in in-role safety behaviour (IRSB), 73 per cent in safety citizenship towards colleagues (SCBI), 66 per cent in safety citizenship towards the organisation (SCBO), and 82 per cent in unsafe behaviour (USB) is attributable to between-person variability. These statistics indicate safety behaviours vary considerably between individuals and thus multilevel analyses are justified (cf. Schreurs, Hetty van Emmerik, Guenter, & Germeys, 2012). These statistics also indicate that there is considerable within-person variation. By subtracting the ICC(1) from 100%, one arrives at the variability of individuals on these factors on a day-to-day basis. In particular, affect demonstrates between 22% and 38% variability and cognitive failure 27% on a day-to-day level. Safety behaviours also demonstrate considerable within-person variation; for example, 34% of the variation in safety citizenship behaviour occurs at the day level. In simple terms, the higher the within-person percentage, the less consistent people are and the more their behaviour or experience varies daily in concert with factors like breach rather than with dispositional factors, such as their personality.

Time and serial dependencies

Given that individuals might experience day-to-day variations in their feelings and behaviours irrespective of the events and perceptions of interest (i.e. global perceptions of breach and fulfilment; negative and positive psychological contract events), time was included as a control in all analyses of day-level variables. Failure to control for these factors in longitudinal designs can bias parameter estimates (Bliese & Ployhart, 2002).

Following a procedure outlined by Bliese & Ployhart, (2002), a series of models were tested for each outcome variable (1) to establish if time operated as a fixed effect and behaviours increased or decreased over time; (2) to establish if the effect of time varied according to the individual (i.e. did the slope vary); and (3) to establish if there were serial dependencies in the data; i.e. were reported levels of a criterion (e.g. positive mood) at time t related to those reported at time $t - 1$?

Results, (Appendix B), indicate that adding time as a fixed parameter significantly improved model fit for cognitive failure, negative mood, in-role safety behaviour and safety citizenship towards the organisation. These outcomes decreased significantly over the course of diary entries. Accordingly, time was added as a fixed parameter for subsequent analyses.

Adding a random parameter for time also significantly improved model fit for all outcomes, except cognitive failure and pleasant mood. Individuals differed in the extent to which psychological experiences and behaviours decreased over time. Thus, time as a random component is included in subsequent analyses for all variables bar the above.

The non-independence of responses was apparent in the improved model fit statistics for violation, pleasant and unpleasant mood. There is a positive relationship between a participant's responses at adjacent time points. Consequently, an autoregressive component is included in subsequent analyses for these variables.

Table 6.1*Means, SDs and intercorrelations of all study variables.*

Variable	Mean	SD	ICC(1)	1	2	3	4	5	6	7	8	9	10	11	12
1 Positive (fulfilment) events*	1.62	2.44	0.36		-.02	.02	.01	-.06	.10*	-.02	.06	.02	-.04	-.02	-.07
2 Negative (breach) events*	1.71	2.41	0.43	.60**		-.01	.20**	.32**	-.02	-.12*	.23**	.05	.02	-.01	-.05
3 Antecedent emotion regulation*	0.67	0.29	0.31	.32**	.28**		.19**	-.08	.15**	-.01	.14**	.32**	.25**	.23**	.07
4 Respondent emotion regulation*	0.20	0.29	0.37	.24**	.35**	.33**		.13**	.12*	-.25**	.25**	.13**	.15**	.03	-.01
5 Psychological contract violation	2.04	0.77	0.62	.30**	.45**	.28**	.29**		.04	-.18**	.19**	-.06	.01	.01	-.07
6 Cognitive failure*	0.14	0.20	0.73	.36**	.35**	.29**	.42**	.24**		-.07	.21*	.12*	.10*	.12*	.09*
7 Pleasant mood	3.95	1.05	0.78	-.11*	-.17**	.03	-.20**	-.22**	-.09		-.41**	.02	-.09	.03	.03
8 Unpleasant mood	1.72	0.55	0.62	.19**	.30**	.36**	.29**	.36**	.40**	-.28**		.00	.11*	.00	-.07
9 In-role safety behaviour	3.62	1.53	0.71	.09	.04	.34**	.18**	.07	.14**	.04	.18*		.49**	.48**	.14**
10 Safety citizenship individual	3.52	1.91	0.73	-.03	-.18	.34**	.18**	.05	.17**	.04	.26**	.74**		.51**	.13**
11 Safety citizenship organisation	3.44	1.81	0.66	.08	.04	.35**	.13**	.09	.17**	.11*	.16**	.71**	.75**		.16**
12 Unsafe behaviour	1.71	1.09	0.82	.33**	.27**	.42**	.34**	.31**	.51**	-.25**	.36**	.47**	.41**	.38**	

Note. Analyses for day- and person-level variables are based on $N = 50$ participants and 458 diary entries. Level 2 between-person intercorrelations are below the diagonal. Level 1 within-person intercorrelations are above the diagonal. ❖ = Yes no response option, coded as 1=yes; 0=no.

* = $p < .05$; ** = $p < .01$

6.5.2 Direct effects of breach and fulfilment on affect and attention

Hypotheses were tested by regressing mood and violation onto person-mean (Level 2) and person-mean centred (Level 1) versions of fulfilment and breach having controlled for time and autoregression where necessary. Variation is thus partitioned into its two levels and results indicate whether within-person (Level 1) or between-person (Level 2) differences explain outcomes. However, only Level 1 results are reported as the survey reported between-person findings. Fulfilment and breach were entered together to establish whether positive experiences ameliorated the effects of negative experiences. All measures were standardised. Intercept figures indicate the extent to which the results deviate from the sample mean 0 for the outcome being discussed.

RQ2a: What is the relationship of breach and fulfilment with violation?

Table 6.2 presents the coefficients of breach and fulfilment events' relationship with daily mood and violation at the within-person levels.

According to Hypothesis 1a, breach will negatively predict and fulfilment positively predict pleasant mood. This is unsupported. Pleasant mood appears to be relatively stable and immune to breach and fulfilment as witnessed by the non-significant time parameter ($\gamma_{01} = -.00, p > .05$) and the significant autoregression parameter ($\gamma_{02} = .28, p < .001$). When an employer exceeds its obligations, there appears to be no discernible change in affect at the within-person level, either for positive (pleasant mood) or negative affect (unpleasant mood and violation). Individuals who experience more positive events are not happier than those who do not and positive events do not appear to improve the unpleasant mood arising from breach events.

H1b is partly supported; breach predicts both unpleasant mood (UM, $\gamma_{06} = .13, p < .001$) and violation (PCV, $\gamma_{06} = .16, p < .001$) at the within-person level. Moreover, the relationship between breach and unpleasant mood at the day level (γ_{06}) is significant despite the inclusion of fulfilment.

Table 6.2

Direct effects of breach and fulfilment on pleasant and unpleasant mood, violation and cognitive failure.

Parameter	Pleasant Mood	Unpleasant Mood	Violation	Cognitive Failure
Intercept γ_{00}	.01	.19	-.06	.12
Time ¹ γ_{01}	-.00	-.04**	.03	-.03***
Autoregression ² γ_{02}	.28***	.18*	.35***	-.02
<i>Level 1: within-person</i>				
Fulfilment (controlling for breach) γ_{05}	.00	.01	-.03	.02
Breach (controlling for fulfilment) γ_{06}	-.04	.13***	.16***	-.01
<i>Final model summary³</i>				
-2LL	725.28	903.35	878.96	838.92

Note. $N = 50$, $n = 458$; ¹Time = Day of study with day 1 = 0. ²Autoregression = correlation between adjacent time points. ³ Breach and fulfilment entered together. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

In summary, these results support the proposition that individuals are primed to react to negative stimuli greater than positive stimuli. They provide confirmation of both psychological contract theory and AET in that the ebb and flow of the employment relationship is an important source of affect at work. Day-to-day changes in the employment relationship relate to changes in violation and experiences of unpleasant mood, but not pleasant mood. These results suggest that it is right to study daily affective experiences, as the effects of breach on unpleasant affect are significant within-person.

RQ2b: What is the relationship of fulfilment and breach with cognitive failure?

Table 6.2 also presents results of the direct effect of breach and fulfilment on cognitive failure. Tables 6.3 to 6.4 overleaf present the coefficients arising from the regression of unpleasant mood and violation on cognitive failure.

Once again, the models are constructed in two phases; first the controls are entered and then concurrently, the predictors at the between- and within-person levels. Significant coefficients indicate the unique variance explained by the construct under examination. Only Level 1 results are reported.

Hypothesis 2 predicted that the efforts to maintain emotional equilibrium in the face of a breach of one's psychological contract would deplete attentional resources and over-fulfilment would replenish these reserves, (H2a). This hypothesis is unsupported. Breach events do not appear to tax an individual's attentional resources on a day-to-day basis.

Contrary to predictions, over-fulfilment does not appear to replenish an individual's attentional resources; the relationship between over-fulfilment and cognitive failure was non-significant at both levels of analysis.

RQ2c: What is the relationship between violation and cognitive failure?

Prior to analysing the mediated effect of breach and over-fulfilment on safety behaviours, this section tests the hypothesis that breach and over-fulfilment relate indirectly to cognitive failure through their effects on violation and daily mood, Hypotheses 2b and 2c respectively.

Violation, unpleasant mood and cognitive failure

Table 6.3 displays the coefficients for violation. Day-to-day changes in the relationship of violation with cognitive failure are non-significant ($\gamma_{03} = .03, p > .05$). Table 6.4 displays the coefficients for daily mood. Those individuals who experienced day-to-day increases in their unpleasant mood also experienced increases in cognitive failure ($\gamma_{08} = .09, p < .01$). Hypothesis 2b is supported in respect of unpleasant mood only.

Pleasant mood and cognitive failure

Experiences of pleasant mood at the within-person level were negatively related to cognitive failure, but the coefficient was non-significant (Table 6.4). Hypothesis 2c is therefore unsupported.

Table 6.3
Direct effects of violation on cognitive failure.

Parameter	Cognitive failure
Intercept γ_{00}	.12
Time γ_{01}	-.03**
Level 1 Violation γ_{03}	.03
<i>Model summary</i>	
-2LL	874.57

Note. $N = 50, n = 458$. * $p < .05$; ** $p < .01$.

Table 6.4*Direct effects of pleasant and unpleasant mood on cognitive failure.*

Parameter	Cognitive Failure
Intercept γ_{00}	.10
Time γ_{01}	-.02**
<i>Level 1: within-person</i>	
PM (controlling for UM) γ_{09}	-.00
UM (controlling for PM) γ_{10}	.09**
<i>Final model summary</i>	
-2LL	885.05

Note. $N = 50$, $n = 458$; PM = Pleasant Mood; UM = Unpleasant Mood. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 6.5 below displays the results, which indicate that unpleasant mood is the only predictor that explains unique variance in cognitive failure at day levels ($\gamma_{07} = .08$, $p < .01$). Accordingly, only unpleasant mood is carried forward into the third step, Sobel's (1982) test of indirect effects. These are reported in Table 6.6. Unpleasant mood mediates the positive relationship between breach and cognitive failure ($\gamma_{ab} = .01$, $z = 2.27$, $p < .05$). How one feels about one's experiences (unpleasant mood) is more important than how one thinks about them (violation) where cognitive failure is concerned.

Table 6.5*Direct effects of breach, violation and unpleasant mood on cognitive failure.*

Parameter	Cognitive Failure
Intercept γ_{00}	.08
Time γ_{01}	-.02*
<i>Level 1: within-person level</i>	
Breach γ_{05}	-.03
Violation γ_{06}	.01
Unpleasant mood γ_{07}	.08**
<i>Model summary</i>	
-2LL	808.76

Note. Over-fulfilment and pleasant mood were also included in the model, but are not reported for the sake of brevity. $N = 50$, $n = 458$. * $p < .05$; ** $p < .01$.

Table 6.6*Indirect effect of breach events via unpleasant mood on cognitive failure (Level 1).*

Parameter	Unpleasant daily mood	Cognitive failure
<i>Indirect effect via unpleasant mood</i>		
Direct effect of breach events (<i>a</i>)	.13 (.03)***	
Direct effect of unpleasant mood (<i>b</i>)		.09 (.03)**
Indirect effect of breach events (<i>a x b</i>)		.01*
Sobel test <i>z</i> (<i>p</i>)		2.27 (.023)

Note. $N = 50$, $n = 458$. * $p < .05$; ** $p < .01$; *** $p < .001$.

In summary, these results provide partial support for the propositions arising from EDT; namely managing aversive emotions taxes attentional self-control resources and results in cognitive failure. However, it is only in respect of unpleasant mood at the day level that the effects on attentional resources are witnessed. Furthermore, pleasant mood does not appear to replenish individual's attentional resources.

6.5.3 Indirect effects via violation and cognitive failure on safety behaviours

Remembering the central topic of this thesis is the mediation of breach and fulfilment on safety behaviours via violation and cognitive failure, the results of analyses of indirect effects are now reported.

These analyses are conducted with variables at the Level 1 within-person centred controlling for Level 2 between-person effects; in effect a 1-1-1 mediation analysis (Krull & MacKinnon, 2001; Preacher, Zyphur, & Zhang, 2010). The methodology follows the second of the two outlined in Krull & MacKinnon (2001); namely a three-step process in which, (1) the direct effect of the predictor on the mediating variables is examined; (2) the effect of the mediator on the dependent variables is examined controlling for the predictor; (3) Sobel's (1982) test is applied to the variance in the standard error of the product of the estimates from step 1 and 2, to determine the significance of the mediated effect.

Step 1 of Krull and MacKinnon's procedure was reported above and indicated that breach predicts both violation and unpleasant mood. In the second step, the combined effects of events, mood and violation were tested on cognitive failure and indicated that unpleasant mood is the only predictor that explains a significant amount of unique variance in cognitive failure (see Tables 6.5 and 6.6).

RQ3a: To what extent does violation mediate the relationship of fulfilment and breach with outcomes?

For the next step, the effect of violation as a predictor of safety behaviours after controlling for breach and over-fulfilment was examined. Hypothesis 3a predicted that violation and unpleasant mood would mediate the negative relationships between breach and pro-safe behaviours. Further, it was predicted that they would mediate the positive relationship between breach and unsafe behaviour (H3b).

Table 6.7 indicates that when breach and over-fulfilment are controlled for, day-to-day violation is a predictor of safety citizenship towards the organisation ($\gamma_{07} = .07, p < .05$). Individuals' safety citizenship towards their organisation *increases* when they experience violation, rather than decreasing. This is contrary to a violation hypothesis and is difficult to explain in terms of AET. Feelings associated with violation would ordinarily disturb, not facilitate, prosocial behaviours. Sobels' test of the indirect effect of breach via violation on safety citizenship towards the organisation is significant, but in the opposite direction to that predicted (Table 6.8; $\gamma_{ab} = .01, z = 2.04, p < .05$).

Table 6.7
Direct effects of breach, fulfilment and violation on outcomes.

Parameter	IRSB	SCBI	SCBO	USB
Intercept γ_{00}	.31*	.23	.28*	.15
Time γ_{01}	-.04**	-.02	-.04*	-.02*
<i>Level 1</i>				
Fulfilment γ_{05}	-.00	-.02	-.02	.02
Breach γ_{06}	-.00	-.01	-.04	-.02
Violation γ_{07}	-.03	.00	.07*	-.02
<i>Model summary</i>				
-2LL	771.51	771.96	781.73	622.77

Note. $N = 50, n = 458$. * $p < .05$; ** $p < .01$; *** $p < .001$. IRSB= In-role Safety Behaviour; SCBI = Safety Citizenship towards Individuals; SCBO = Safety Citizenship towards Organisation; USB = Unsafe Behaviour.

Table 6.8*Indirect effects of breach via violation on outcomes (Level 1).*

Parameter	Violation	SCBO
<i>Indirect effect via violation</i>		
Direct effect of breach (a)	.16 (.03)***	
Direct effect of violation (b)		.07* (.03)
Indirect effect of breach (a x b)		.01*
Sobel test z (p)		2.04 (.041)

Note. $N = 50, n = 458$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$. SCBO = Safety Citizenship towards Organisation.

Table 6.9*Direct effects of breach, fulfilment and daily mood on outcomes.*

Parameter	IRSB	SCBI	SCBO	USB
Intercept γ_{00}	.36**	.24*	.33**	.15
Time γ_{01}	-.05**	-.02	-.05**	-.02*
<i>Level 1</i>				
Fulfilment γ_{05}	-.01	-.03	-.01	.02
Breach γ_{06}	-.00	-.02	-.03	-.02
Pleasant mood γ_{07}	.01	.00	.02	-.03
Unpleasant mood γ_{08}	-.01	.04	-.02	-.05*
<i>Model summary</i>				
-2LL	806.45	792.40	839.72	702.73

Note. $N = 50, n = 458$. † = $p < .10$; * = $p < .05$; ** = $p < .01$; *** = $p < .001$. IRSB = In-role Safety Behaviour; SCBI = Safety Citizenship towards Individuals; SCBO = Safety Citizenship towards Organisation; USB = Unsafe Behaviour.

Table 6.10*Indirect effect of breach via unpleasant mood on outcomes (Level 1).*

Parameter	UM	USB
<i>Indirect effect via unpleasant mood</i>		
Direct effect of breach (a)	.13 (.03)***	
Direct effect of UM (b)		-.05* (.03)
Indirect effect of breach (a x b)		-.007
Sobel test z (p)		1.56 (.12)

Note. $N = 50, n = 458$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$. UM = Unpleasant Mood. USB = Unsafe Behaviour.

Day level unpleasant mood did not negatively relate to any pro-safe behaviours (coefficient γ_{08} in Table 6.9). Contrary to AET, unpleasant mood did not appear to disturb an individual's ability to make a safety contribution by compromising their motivation to engage in in-role and safety citizenship behaviours. Therefore, H3a is unsupported.

Contrary to predictions (H3b), neither violation nor unpleasant mood mediated the within-person relationship between breach and unsafe behaviour. In respect of violation, there does not appear to be a relationship between day-to-day feelings of violation and unsafe behaviour (Table 6.7; $\gamma_{07} = -.02, p > .05$).

On the other hand, unpleasant mood did relate to unsafe behaviour at the day-level. However, this was in the opposite direction to that predicted (Table 6.9; $\gamma_{08} = -.05, p < .05$) and the indirect effect was non-significant (Table 6.10). Once again, the day-level finding appears counterintuitive. According to AET, unpleasant mood ought to relate to more unsafe behaviour, not less. Hypothesis H3b is unsupported.

RQ3a: To what extent does cognitive failure mediate the relationship of fulfilment and breach with outcomes?

Table 6.11 displays the results of cognitive failure on outcomes after controlling for pleasant and unpleasant mood. Breach did not predict cognitive failure and thus Hypothesis 4a is unsupported; cognitive failure does not mediate the relationship between breach and outcomes. Hypothesis 4b predicted that cognitive failure would mediate the relationship of unpleasant mood with outcomes. At the day level, cognitive failure has a significant positive relationship with IRSB ($\gamma_{07} = .05, p < .05$) and SCBO ($\gamma_{07} = .06, p < .05$), which is in the opposite direction to that predicted: the more cognitive failures individuals report, the stronger their pro-safe behaviour is. The day-level relationship with SCBI is non-significant ($\gamma_{07} = .03, p > .05$). The day-level relationship with USB was in the predicted direction (H4c) and verging on significance ($\gamma_{07} = .03, p < .10$).

Sobel's test of the indirect effect of unpleasant mood via cognitive failure (Table 6.12) on IRSB does not reach recognised levels of significance ($\gamma_{ab} = .004, z = 1.71, p < .10$). The same applies to SCBO ($\gamma_{ab} = .005, z = 1.69, p < .10$). As was found for the motivation pathway, day-to-day cognitive failures relate *positively* not negatively to outcomes, suggesting that the relationship is reversed; i.e. those individuals who put in more effort and concentrate hard on their safety tasks experience more cognitive failure, not those who experience more cognitive failure have reduced capacity to engage in safety behaviour. Therefore, hypotheses H4b and H4c are unsupported.

Table 6.11*Direct effects of pleasant, unpleasant mood and cognitive failure on outcomes.*

Parameter	IRSB	SCBI	SCBO	USB
Intercept γ_{00}	.34**	.24*	.32**	.19†
Time γ_{01}	-.04**	-.02	-.04**	-.02*
<i>Level 1</i>				
Pleasant mood γ_{05}	-.01	-.01	.02	-.00
Unpleasant mood γ_{06}	-.00	.03	-.04	-.04*
Cognitive failure γ_{07}	.05*	.03	.06*	.03†
<i>Model summary</i>				
-2LL	836.38	832.87	876.60	642.38

Note. $N = 50, n = 458$. † = $p < .10$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$. IRSB = In-role Safety Behaviour; SCBI = Safety Citizenship towards Individuals; SCBO = Safety Citizenship towards Organisation; USB = Unsafe Behaviour.

Table 6.12*Indirect effects of unpleasant mood via cognitive failure on outcomes (Level 1).*

Parameter	Cognitive failure	IRSB	SCBO
<i>Indirect effect via cognitive failure</i>			
Direct effect of unpleasant mood (a)	.08 (.03)***		
Direct effect of cognitive failure (b)		.05 (.02)*	.06 (.03)*
Indirect effect of unpleasant mood (a x b)		.004 †	.005 †
Sobel test z (p)		1.71(.09)	1.69 (.09)

Note. $N = 50, n = 458$. † = $p < .10$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$. IRSB = In-role Safety Behaviour; SCBO = Safety Citizenship towards Organisation.

6.5.4 Moderating effects of emotion regulation strategy on mediators and outcomes

The last set of results reported are those that examine the moderating effects of an individual's emotion regulation strategy. Tables 6.13 to 6.15 contain the parameter estimates. For the sake of brevity, and given between-person results have been reported in the survey above, only within-person results are reported here. As with previous analyses, the variables were centred within context and between person means reintroduced (Kreft & de Leeuw, 1998). Unique variance at each level is examined and confounding Level 2 with Level 1 variance is avoided. The interaction of the predictor and the moderator are computed at the within-person centred level of the variables.

RQ4a: To what extent does emotion regulation strategy moderate the relationship of breach with violation and cognitive behaviour?

Table 6.13 displays results for the interaction of antecedent-focussed emotion regulation strategy (AERS) and response-focussed emotion regulation strategy (RERS) with breach.

Hypothesis 5a predicted that an AERS would dampen the negative effect of a breach event on both individuals' feelings of violation and experience of cognitive failure. This hypothesis is unsupported. For violation, the only significant predictor was the occurrence of a breach event as reported above. For cognitive failure, day-level use of an AERS positively predicted day-to-day cognitive failure (AERS $\gamma_{03} = .07, p < .05$), suggesting that this type of emotion regulation strategy is associated with depletion rather than preservation of attentional resources.

Table 6.13
Moderating effects of antecedent- and response-focussed emotion regulation on breach (Level 1).

Parameter	Violation	Cognitive Failure
AERS γ_{03}	-.02	.07*
AERS x Breach γ_{04}	-.02	.01
<i>Model summary</i>		
-2LL	852.36	886.22
RERS γ_{03}	.04	.05
RERS x Breach γ_{04}	.04†	.01
<i>Model summary²</i>		
-2LL	833.94	828.04

Note. $N = 50, n = 458$. AERS = Antecedent focused Emotion Regulation Strategy. RERS = Response focused Emotion Regulation Strategy. † $p < .10$; * $p < .05$.

Neither violation nor cognitive failure increased when the interaction term for a RERS was included in the analyses. Hypothesis 5b is unsupported. Surprisingly, the relationship of RERS with cognitive failure was non-significant. Deployment of rumination and suppression of feelings did not relate to day-to-day cognitive failure.

RQ4b: To what extent does emotion regulation strategy moderate the relationship of violation and cognitive behaviour with behaviours?

The moderating effect of antecedent emotion regulation strategy (AERS) was predicted to dampen the negative effect of psychological contract violation (PCV) and cognitive failure (CF)

on pro-safe behaviours (IRSB, SCBI, SCBO) and dampen their positive effects on unsafe behaviour (USB) (H6a).

As the figures are at the within-person level where the scores are centred around each individual's own mean score, the results indicate the extent to which change in the amount of AERS used by the individual interacts with the change in the level of violation experienced to influence outcomes. Hypothesis 6a is unsupported; the effects of the interaction of AERS and PCV, and AERS and CF on pro-safe behaviours are non-significant. By far the strongest predictor of pro-safe behaviour was AERS; individuals who engage in strategies such as trying to find humour in the situation report more frequent safe behaviour, both in-role and discretionary.

Table 6.14
Moderating effects of antecedent-focussed emotion regulation on violation and cognitive failure (Level 1).

Parameter	IRSB	SCBI	SCBO	USB
AERS γ_{03}	.11***	.14***	.09**	.01
AERS x PCV γ_{04}	-.04†	.01	.01	-.03
<i>Model summary</i> ²				
-2LL	775.26	795.62	815.51	641.26
AERS γ_{03}	.11***	.12***	.11***	.01
AERS x CF γ_{04}	.01	.01	.05†	-.01
<i>Model summary</i> ²				
-2LL	826.28	828.80	867.06	651.21

Note. $N = 50$, $n = 458$. AERS = Antecedent focused Emotion Regulation Strategy. PCV = Psychological Contract Violation. CF = Cognitive Failure. IRSB = In-role Safety Behaviour; SCBI = Safety Citizenship towards Individuals; SCBO = Safety Citizenship towards Organisation; USB = Unsafe Behaviour. † = $p < .10$; * = $p < .05$; ** = $p < .01$; *** = $p < .001$

An AERS is also predicted to interact with cognitive failure such that individuals who engage in AERS will experience less cognitive failure and this will dampen the effect of CF on outcomes. The interaction terms of AERS and CF with safe and unsafe behaviour were all non-significant at the $p < .05$ level. However, the interaction term of AERS and CF had a marginally significant relationship with safety citizenship towards the organisation ($\gamma_{05} = .05$, $p < .10$). This suggests that an AERS enhances an individual's capacity to engage in discretionary behaviour that protects their company's safety interests.

Where a response focussed emotion-regulation strategy (RERS) is concerned, it was predicted to exacerbate the effects of both PCV and CF (H6b) such that the interaction of RERS with each

would accentuate the negative relationship with pro-safe behaviour and the positive relationship with unsafe behaviour. H6b is not supported. Rumination and emotion suppression do not appear to exacerbate violation or cognitive failure. However, this type of behaviour had a positive relationship with safety citizenship towards colleagues ($\gamma_{05} = .07, p < .10$) when controlling for violation and RERS was positively related to SCBI ($\gamma_{05} = .08, p < .01$) when controlling for cognitive failure. This suggests that rumination and helping out one's colleagues co-occur. However, the reasons for the positive relationship are not clear and it is not possible to determine whether RERS preceded or followed SCBI as they were measured concurrently.

Table 6.15
Moderating effects of response-focused emotion regulation on violation and cognitive failure (Level 1).

Parameter	IRSB	SCBI	SCBO	USB
RERS γ_{03}	.05†	.07**	-.01	-.00
RERS x PCV γ_{04}	.00	.00	-.02	.00
<i>Model summary²</i>				
-2LL	751.23	777.25	781.95	642.57
RERS γ_{03}	.04†	.08**	.00	-.01
RERS x CF γ_{04}	-.03	-.03	.00	.02
<i>Model summary²</i>				
-2LL	769.67	797.36	839.37	653.07

Note. $N = 50, n = 458$. RERS = Response-focused Emotion Regulation Strategy. PCV = Psychological Contract Violation. CF = Cognitive Failure. IRSB = In-role Safety Behaviour; SCBI = Safety Citizenship towards Individuals; SCBO = Safety Citizenship towards Organisation; USB = Unsafe Behaviour. † = $p < .10$; * = $p < .05$; ** = $p < .01$

6.5.5 Summary of results by RQ and hypothesis

Table 6.16 below summarises the hypotheses according to their research question and indicates which have been supported and which have not. These findings are all in respect of day level (Level 1) analyses.

Table 6.16
Summary of support for hypotheses.

Hypotheses	Support (Day Level)
H1a Breach events negatively predict and over-fulfilment events positively predict pleasant mood.	Unsupported. Neither over-fulfilment nor breach events associated with pleasant mood.
H1b: Breach events positively predict unpleasant mood and violation whereas over-fulfilment events negatively predict each.	Partially supported in respect of breach.
H2a: Breach events positively predict and fulfilment events negatively predict cognitive failure	Unsupported.
H2b: Violation and unpleasant mood mediate the positive relationship between breach events and cognitive failure.	Partially supported. Unpleasant mood associates with cognitive failure and mediates the positive relationship of breach to cognitive failure.
H2c: Pleasant mood mediates the negative relationship between over-fulfilment events and cognitive failure.	Unsupported.
H3a: Violation and unpleasant mood mediate the negative relationship between breach events and safety behaviour.	Unsupported. Violation positively not negatively associates with safety citizenship.
H3b: Violation and unpleasant mood mediate the positive relationship between breach events and unsafe behaviour	Unsupported. Unpleasant mood negatively not positively associates with unsafe behaviour.
H3c Pleasant mood mediates the positive relationship between fulfilment events and safety behaviours	Unsupported.
H3d: Pleasant mood mediates the negative relationship between fulfilment events and safety behaviours	Unsupported.
H4a Cognitive failure mediates the negative relationship between fulfilment events and unsafe behaviour	Unsupported.
H4b Cognitive failure mediates the negative relationship between violation, unpleasant mood and safety behaviour	Unsupported. Cognitive failure positively not negatively associates with in-role and organisational citizenship safety behaviour.
H4c Cognitive failure mediates the positive relationship between violation, unpleasant mood and unsafe behaviour	Unsupported. Cognitive failure associates positively with unsafe behaviour but does not reach accepted levels of significance.
H4d Cognitive failure mediates the positive relationship between pleasant mood and safety behaviour	Unsupported.
H5a Deployment of an antecedent-focused emotional regulation strategy (AERS) dampens the negative consequences of a breach event on violation and cognitive failure.	Unsupported.

Hypotheses	Support (Day Level)
H5b Deployment of a response-focused emotion regulation strategy (RERS) exacerbates the negative consequences of a breach event on violation and cognitive failure.	Unsupported.
H6a Deployment of an AERS dampens the negative behavioural consequences of violation and cognitive failure.	Unsupported. However, day-level use of an AERS positively predicted pro-safe behaviour.
H6b Deployment of a RERS exacerbates the negative behavioural consequences of violation and cognitive failure.	Unsupported. Day-level RERS <i>positively</i> predicted SCBI; rumination and helping one's colleagues appear to co-occur.

6.6 Discussion of results

Psychological contract theory emphasises the importance of employers' promise keeping behaviour for employees' psychological well-being and performance. Although theoretical accounts make reference to the anger that individuals feel when employers betray them (Robinson & Rousseau, 1994; Rousseau, 1989) and the uplifting feelings when employers stand by their commitments (Guerrero & Herrbach, 2008), most research is cross-sectional (Conway & Briner, 2005, 2009). However, emotions are created in the moment and cannot be conjured up from memory (Robinson & Clore, 2002). Similarly, psychological contract events occur in the moment; the respondent may feel very differently about their employer five minutes before an event compared to what they feel five minutes after they have been told that they are or are not going to be promoted. Consequently, the extant psychological contract literature largely captures memories about emotional experiences (Briner & Kiefer, 2005) rather than actual experiences.

This study was designed to capture experiences as close in time as possible to events without interfering with employees' work. A daily diary method was used, which employed event and interval sampling. To my knowledge, it is the first quantitative diary study in a safety context and one of the very few to have been conducted using psychological contract theory.

The purpose of the diary was fourfold; first to study the unfolding nature of the psychological contract and the motivational and attentional effects on employees when employers commit breaches of faith, as well as act in ways that are pleasing and grandiose. By registering events and experiences as they co-occurred, it was possible to determine the consistency or variability of individuals' affective reactions (RQ2a) as well as the consequences of the events for their

attentional resources (RQ2b). The daily recording also enabled the link between affect and attention to be examined (RQ2c).

Secondly, the purpose was to establish if safety behaviour varied on a day-to-day basis and, if so, to deploy theories that could account for this daily variation. AET and EDT were proffered and tested via daily measures of violation, mood and cognitive failure to establish if they could explain the process by which motivation (RQ3a) and attention (RQ3b) mediate the relationship between events and safety behaviour. Finally, the purpose was to establish if the relationship between events and psychological experience (RQ4a) and between psychological experiences and behaviour (RQ4b) were modified when individuals used different emotion-regulation strategies. Reflections on the results are now presented according to the research questions.

6.6.1 RQ2a. What is the relationship of fulfilment and breach with violation and affect?

This study found that breach was related to feelings of violation and unpleasant mood at the day level. This supports the propositions advanced in AET that workplace events are important sources of affect (Weiss & Cropanzano, 1996) and confirms previous research that has shown that breach events generate strong emotional reactions (Conway & Briner, 2002). Breach predicts feelings of violation in the short term as well as over the longer term, whereas it only predicts aversive affect in the short term. This highlights the transitory nature of affect (Russell & Carroll, 1999) and why it is important to study experiences in the moment. However, it also raises questions about the nature of violation. As argued by Weiss and Cropanzano (1996), it is important to ascertain whether individuals are reporting their affective experiences with their object, or their evaluations or a belief about their feelings towards their employer, as affect is a better predictor of behaviour than the cognition is. It would appear that violation contains both an affective and a cognitive component. This is discussed further in Chapter 7.

Where fulfilment is concerned, positive events that should relate to pleasant mood and reduced feelings of violation did not. Given that only cross-sectional analyses were significant, the relationship between fulfilment and affect does not appear to be transitory. Alternatively, and according to the negativity effect (Kanouse & Hanson, 1971), the absence of a significant relationship might suggest that the negative affect associated with a breach event overshadows and undermines the positive effects of a fulfilment event. Scholars (Ohly & Schmitt, 2013) have demonstrated that positive events are only effective buffers of negative events when the event is of the same type, e.g. social support is forthcoming that was previously withdrawn, which might explain the absence of a relationship of fulfilment to affect and violation. However, this explanation is tentative.

6.6.2 RQ2b. What is the relationship of fulfilment and breach with cognitive failure?

Contrary to hypotheses, this study found that neither fulfilment nor breach related to cognitive failure when entered together. The relationships were non-significant at both levels of analysis. However, if solely the relationship of breach events to attentional resources was examined, at the person level of analysis there was a moderate positive relationship indicating that individuals who had more breach events had more cognitive failures. Additionally, when the relationship of fulfilment with cognitive failure was examined alone, individuals who had more positive events also had more cognitive failures, confirming results from the longitudinal study. *Both* over-fulfilment and breach taxed an individual's attentional resources suggesting that the cumulative effects of having to reciprocate an employer's benevolence are as ego depleting as the cumulative effects of being let down. This is consistent with a stress response.

6.6.3 RQ2c. What is the relationship between affect and cognitive failure?

This study confirmed results found in the survey in respect of between-person relationships of violation with cognitive failure. Those individuals who experienced more violation over the 14 days of the diary study also experienced more cognitive failure. However, changes in feelings of frustration and anger with one's employer did not predict changes in attentional disturbances on a day level.

This study also found that unpleasant mood predicted cognitive failure at both the day and the person level. This is consistent with EDT's propositions that managing aversive emotions is ego depleting (Muraven & Baumeister, 2000) and extends the findings of experimental research (e.g. Glass & Singer, 1972) to the field as well as applying EDT to facilitate our understanding of the employment relationship.

Unpleasant mood also mediated the relationship between breach and cognitive failure confirming research that indicates breach is an important source of strain for individuals (Chambel & Oliveira-Cruz, 2010; Gakovic & Tetrick, 2003). This finding also extends our understanding of the process by which breach has its effects and suggests that an EDT perspective can provide useful insights into the unconscious processes at play when employers thwart individuals' need fulfilment.

Lastly, this finding confirms Broadbent's (Broadbent et al., 1982) contention that cognitive failure can be an indicator of within-person responses to workplace stress as well as an indicator of trait-based cognitive rigidity.

6.6.4 RQ3a. To what extent does affect mediate the relationship of fulfilment and breach with outcomes?

This study found that on days when individuals detected a breach, they also experienced increased feelings of anger towards their employer. This finding supports violation research and extends the understanding of the affective consequences of breach to a within-person level of analysis. However, the only significant mediated relationship of breach with safe or unsafe behaviour via violation was with organisationally targeted safety citizenship behaviour. The relationship was positive indicating that breach via violation was associated with an *increase* not a decrease in this behaviour. This is counter-intuitive and does not fit with an AET perspective, which suggests that negative affect closes individuals down and makes them less prosocial, not more.

Similarly, unpleasant mood associated *negatively* with unsafe behaviour. This indicates that when individuals felt down, their propensity to take shortcuts *reduced*. Again, one would expect the negative affect to disrupt their motivation to follow prescribed rules, not facilitate it. This finding that the sign is different at different levels of analysis is discussed further in Chapter 7.

Where over-fulfilment was concerned, no significant relationships were found with violation, pleasant or unpleasant mood and thus affect did not appear to mediate the relationship between an employer's benevolence and pro-safe or unsafe behaviour. This was true at both levels of analysis. This suggests that employees do not appreciate it when employers exceed their obligations, or, the level of positive affect generated by fulfilment is too weak to be detected.

Interestingly, person-level pleasant mood had a strong and significant relationship with all pro-safe behaviours (compliance, citizenship towards colleagues and one's employer), as well as a negative relationship with unsafe behaviour. These findings appear to suggest that bad is not stronger than good where affect's influence on safety behaviour is concerned. This appears to contradict Baumeister et al's (2001) assertions.

6.6.5 RQ3b. To what extent does cognitive failure mediate the relationship of fulfilment and breach with outcomes?

As discussed above, this study found that neither breach nor fulfilment predicted cognitive failure and thus the indirect effect was not examined. However breach predicted unpleasant daily mood, which predicted daily cognitive failures, thereby supporting the notion that managing negative affect influences attention (Forgas & George, 2001) and causes vigilance errors (Hockey, 1993). Consequently, the indirect effects of unpleasant mood on pro- and unsafe behaviour were examined.

As with the day level analyses in respect of violation, the diary study revealed that cognitive failures were *positively* associated with safety compliance and organisational safety citizenship. On the face of it, these findings appear inconsistent with EDT, which posits that previous efforts at self-control deplete one's capacities to exert self-control elsewhere. They also appear to contradict the findings of the cross-sectional and longitudinal studies, which demonstrated negative relationships between cognitive failure and pro-safe behaviour. If one considers these results as indicative of reverse causality, then efforts at safety compliance and citizenship towards the organisation may be depleting, resulting in individuals' depressed mood. However, given that behaviour and cognitive failure were measured concurrently, it is not possible to confirm this proposition. This is discussed further in the final chapter.

At the day-level, the relationship between cognitive failure and unsafe behaviour was in the predicted direction indicating that within-person attentional lapses are associated with within-person safety lapses, but the coefficient did not reach adequate levels of significance to be relied upon. The between-person findings confirm those of the cross-sectional analyses where cognitive failures were positively associated with unsafe behaviour. Taken together, these findings are suggestive that trait-level is more important than state-level cognitive failure where unsafe behaviour is concerned and supports the work of Wallace and colleagues in this regard (2003a, 2003b). Alternatively, it could signify that these individuals are suffering burnout and it is for these reasons that they fail to avoid risky behaviour (Ahola et al., 2013; Fischer et al., 2012; Hockey, Maule, Clough, & Bdzola, 2000).

6.6.6 RQ4a To what extent does emotion regulation strategy moderate the relationship of breach with violation and cognitive failure?

The analysis of the survey data examined habitual use of emotional regulation strategies. The diary study examined daily use to see if type of strategy interacted with the experience of a breach event to predict day-level changes in psychological outcomes.

An antecedent-focussed emotion-regulation strategy (AERS), wherein individuals attempt to cognitively re-construct their experience (Diefendorff et al., 2008), ought to stave off the emotional response and thus dampen the experience of violation and cognitive failure. This study found that it did not. Instead, this strategy was positively related to cognitive failure indicating that at the moment of its use, it is associated with a taxing of attentional resources.

Contrary to predictions, a response-focussed strategy (RERS) did not interact with breach to predict either violation or cognitive failure, although the relationship of the interaction term with violation was verging on significance. This strategy entails individuals attempting to suppress their emotional response, or re-living it through rumination and ought to exacerbate

negative psychological experiences (Genet & Siemer, 2012). However, this strategy appears not to have appreciable effects on the relationship of breach to psychological experiences.

6.6.7 RQ4b. To what extent does emotion regulation strategy moderate the relationship of violation and cognitive failure with outcomes?

The last aspect of the diary study examined is the moderation by emotion regulation strategy of the relationship of violation and cognitive failure with safety behaviour. The only terms that approached acceptable levels was the interaction of AERS and violation in predicting safety compliance and the interaction of AERS and cognitive failure in predicting organisationally directed safety citizenship. However, for the former, the relationship was negative, indicating that AERS had an exacerbating not dampening effect on violation.

By far the strongest indicator of daily pro-safe behaviour was the daily use of this strategy alone. This finding is consistent with the emotion regulation literature, which has demonstrated that an AERS or deep-acting strategy results in fewer performance decrements compared to an RERS (or surface-acting strategy) (e.g. Goldberg & Grandey, 2007). Curiously, in this study, an RERS, e.g. rumination, appeared to have a positive association with daily safety citizenship towards one's colleagues as well as a marginally significant positive relationship with safety compliance behaviours, such as following safety procedures. The reasons for this are not apparent and are discussed further in Chapter 7.

6.7 Limitations of the study

There are several limitations to this study that warrant consideration. Firstly, all diary entries were recorded at the end of the working day, or last shift. Both events and their motivational and attentional correlates were measured in the same diary entry at the same point in time. Thus, it is not possible to determine the direction of causation. Daily mood and attentional experiences may preface behavioural outcomes, or vice-versa; behaviours may occur before the psychological responses. A further problem of using end of day is that events may have occurred in the early part of the shift and thus there may be an element of recall bias present in responses.

The reason that both psychological and behavioural instances were measured at one point in time at the end of each day was two-fold: (a) to reduce the commitment of respondents by requesting only one diary entry per day; and, (b) to ensure that there was no risk of disruption to the individual's attention while carrying out their work.

Second, common method bias is an ever-present threat to construct validity in self-report studies (Podsakoff et al., 2003). Supervisor reports of safety behaviour were considered but rejected on account of the highly transient nature of work teams in merchant shipping. Supervisor-reportee relationships are often very temporary as one or other of the party comes to the end of their tour of duty and leaves the ship weeks or days into the relationship. Additionally, supervisors often do not have an accurate picture of a reportee's safety behaviour (Lusk et al., 1995). Every attempt was also made to reduce socially desirable responses by ensuring anonymity. While, high inter-dimensional correlations may be present (Sackett, 2002), in safety contexts predictor-outcome relationships ought to be attenuated by social desirability rather than augmented particularly where safety misdemeanours are concerned (Probst, 2004).

Finally, while validated measures were used, they were adapted for use in the diary study. The reduction of items to the use of "yes", "no" responses meant that some scale reliabilities were low. The objective was to reduce the cognitive load on respondents in order to prevent respondent withdrawal. However, this may have had a detrimental effect on validity of the scales and thus the ability to detect the hypothesised relationships in the data.

6.8 Summary

This daily diary study was designed to examine the unfolding psychological contract and to capture within-person changes in affect and attention that are associated with breach and fulfilment events on the one hand, and pro- and unsafe behaviour on the other. The study is novel both in terms of the use of a diary methodology in a safety context, but also in deploying measures that capture the attentional as well as affective disruptions associated with the ebb and flow of the employment relationship.

The study found that more breach events were associated with feelings of violation and unpleasant mood at the day level. However, with the exception of safety citizenship towards the organisation, neither violation nor unpleasant mood mediated the breach-safety behaviour relationship. Furthermore, the sign was positive indicating that as violation increased, citizenship behaviour also increased. An AET perspective would suggest that, even in the moment, negative affect would be disruptive of pro-social behaviour, not facilitative.

In respect of attentional resources, when combined, breach and fulfilment did not predict cognitive failures at either level of analysis. When separated, they both had a positive relationship with cognitive failure at the person level, indicating that individuals who

experience over-fulfilment *or* breach also experience cognitive failures. The non-significant result when they are combined is likely because the mean and standard deviation of both positive and negative events are very similar and thus they are highly correlated. When separated, the finding is consistent with the first tenet of EDT in that managing stress hijacks attention. The absence of significant relationships at the day-level suggests that the effects of psychological contract events on attentional resources are trait-like rather than state-like.

The study went on to find that unpleasant mood mediated the relationship between breach and cognitive failure. This is consistent with the second tenet of EDT, which posits that managing aversive emotions results in a reduced capacity for self-control of attention. This finding extends the application of EDT to the field and to the study of the psychological contract. It also illuminates the within-person unconscious processes operating when employees experience breach events and confirms the value in studying daily cognitive failures.

The study also threw up some unexpected findings. Daily cognitive failures were *positively* associated with increases in safety compliance and organisational safety citizenship. Ego depletion occurs when individuals have to control attention elsewhere, such as managing a bad mood. The bad mood is ego depleting and thus ought to have deleterious consequences for safety behaviour through its effects on attention, not beneficial. While unpleasant mood had a significant positive relationship with cognitive failure, cognitive failure did not associate with reduced safety behaviour. However, in respect of the cognitive failure-behaviour relationships, reverse-causality cannot be ruled out as both cognitive failure and behaviour were measured concurrently. In this regard, the concentration and effort involved in behaving safely might be ego depleting and thus the cause of the cognitive failures. In respect of unsafe behaviour, at the person level, relationships were in the direction expected; individuals who experienced more attentional disruptions also reported more unsafe behaviour. This suggests that cognitive failure is an individual difference construct, but it is not clear whether this is an indicator of personal disposition or emotional exhaustion.

The following chapter brings the findings from the two empirical studies together and discusses the implications of these for the aims of the thesis.

Chapter 7. Discussion and conclusions

7.1 Introduction

This thesis has two main aims. The primary aim was to use psychological contract theory (PCT) to explain the on-going variation in employees' health and safety behaviour. The second aim was to critically examine PCT as a theory of workplace behaviour and the zone of acceptance thought to regulate behaviour. These research aims were satisfied by conducting a review of the literature, two cross-sectional and one longitudinal study, and a 14-day daily diary study.

This chapter discusses the commonalities and differences in the findings in relation to the aims and presents a critique of the theory, a discussion of the limitations in the studies and makes recommendations for future research. The chapter and the thesis are closed with some concluding remarks.

7.2 Key findings in relation to aims

This section summarises the empirical study findings, drawing out the commonalities and contradictions, highlighting the contributions and reflecting on the limitations of the research. Each preceding empirical chapter provided a detailed discussion of the findings so this discussion will focus on the most important implications. Figures 7.1 to 7.3 depict pictorially the studies' principal findings.

7.2.1 Aim 1: To use Psychological Contract Theory to explain on-going health and safety behaviour

The ability of psychological contract theory to explain on-going health and safety outcomes was examined through a survey (Chapter 5) and a diary study (Chapter 6). The survey tested the utility of PCT in explaining health and safety outcomes in two main ways; first, cross-sectionally by analysing the direct and indirect relationship of fulfilment and breach with psychological well-being, in-role safety behaviour, safety citizenship, unsafe and unhealthy behaviour; and, second, longitudinally by analysing whether changes in fulfilment and breach over six months predicted changes in outcomes. The diary study then focused on discrete psychological contract events and tested whether PCT could explain day-to-day variation within an individual's safety performance.

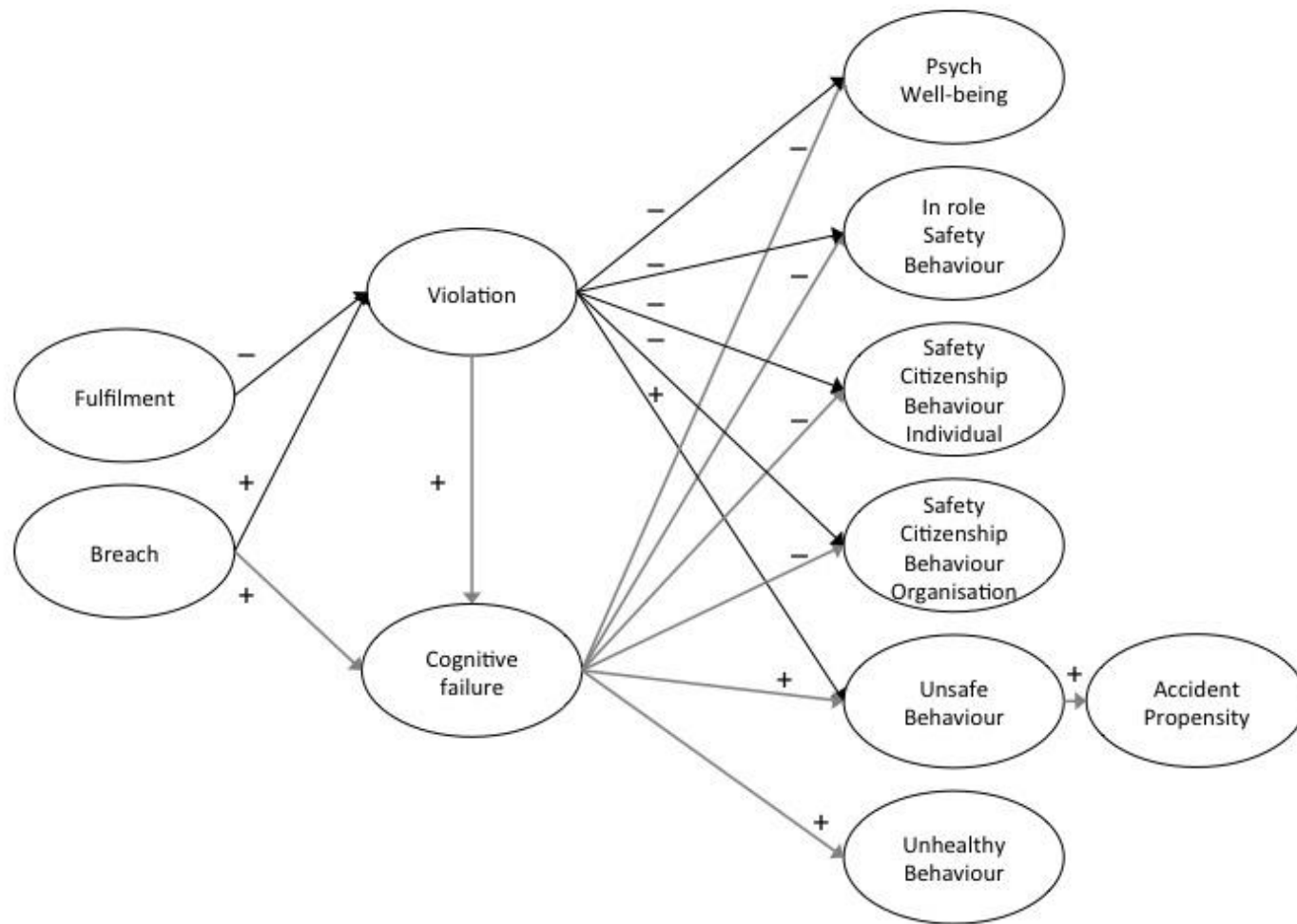


Figure 7.1 Summary of significant structural relationships between antecedents, mediators and outcomes from cross-sectional survey.

Note. Figures 7.1 to 7.3 + and - denote sign of relationship. Bold line = motivation pathway, grey line = attention pathway.

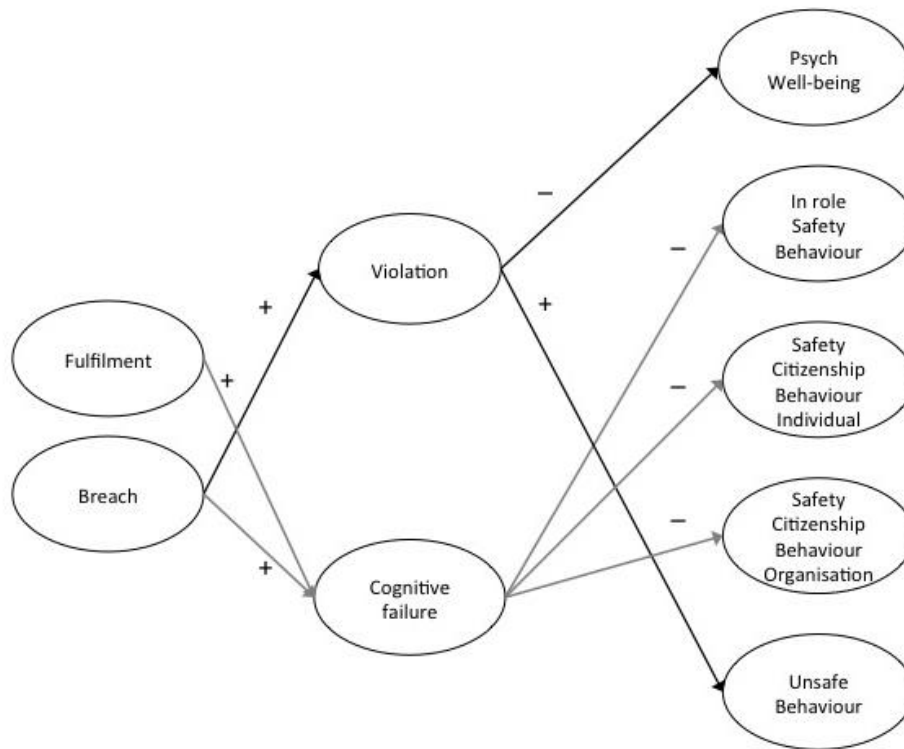


Figure 7.2 Significant change scores from longitudinal study (Time I to Time II = 6 months).

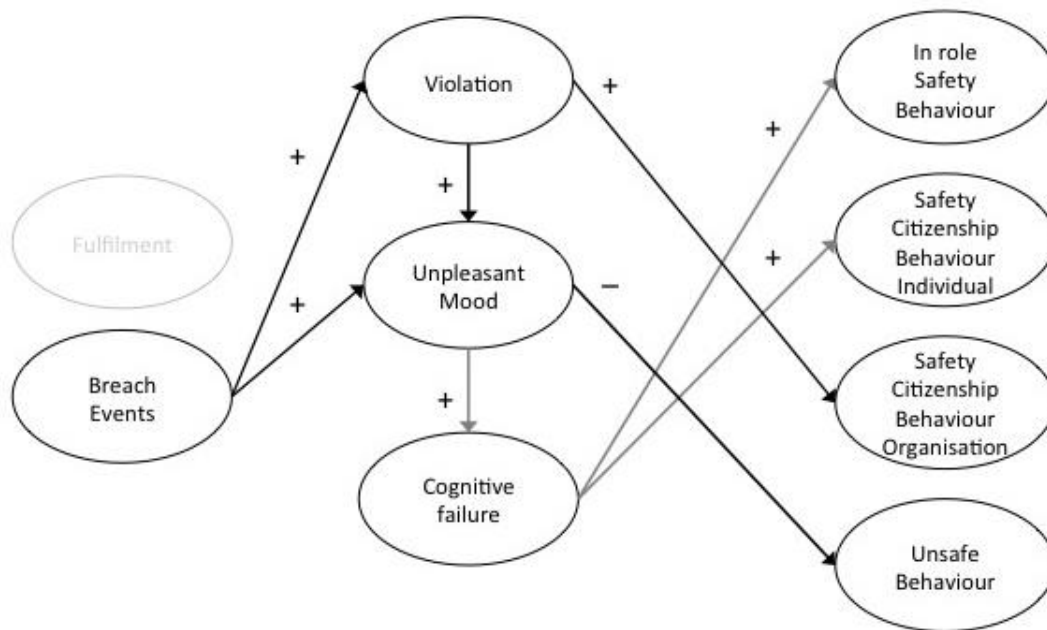


Figure 7.3 Significant within-person coefficients from diary study (Level 1).

In advancing this aim, this thesis makes five important theoretical contributions. The first relates to the ability of psychological contract theory to explain health and safety outcomes. In the survey, the overall relationship of fulfilment and breach (both the direct and the indirect effects combined) with health and safety outcomes was largely as expected, but there were some unexpected findings too. Employees who enjoyed a good employment relationship (fulfilment), consistently (i.e. across samples) reported better psychological well-being and a greater safety contribution in terms of their safety citizenship towards their colleagues. Employees who experienced a breakdown in their employment relationship (breach) consistently reported poorer well-being and a greater negative safety contribution in terms of more frequent unsafe behaviour, such as taking short-cuts. These findings endorse the use of the psychological contract to explain behaviour in a safety context, suggesting that fulfilment and breach have an important bearing on employee's safety contribution as well as their emotional well-being.

Direct relationships were occasionally in the opposite direction to that expected with fulfilment associating with unsafe behaviour as well as well-being and breach associating positively with organisational safety citizenship behaviour. Further, fulfilment's positive relationship with well-being was stronger than breach's relationship was negative, contradicting previous research that suggests fulfilment may do no more than maintain levels of positive affect (Conway et al., 2011). Finally, fulfilment's relationship with outcomes was largely direct (i.e. independent of the mediators) whereas breach's relationship with outcomes was largely indirect (i.e. via violation and cognitive failure). These findings concur with scholars who propose that fulfilment and breach are not on a continuum and researchers need to study *both* to understand the relationship of the psychological contract with outcomes (e.g. Cassar & Briner, 2011). Additionally, these results lend weight to the argument that social exchange is insufficient to explain the process by which the psychological contract has its effects (Conway & Briner, 2009; Conway & Coyle-Shapiro, 2012; Cropanzano, Anthony, Daniels, & Hall, 2016). This thesis suggests that this is true particularly in respect of breach; for example, engaging in unsafe behaviour that may harm oneself and doing more for one's employer is illogical and thus recourse to other theories, such as those deployed in this thesis (AET and EDT), is needed in order to explain these findings.

Second, this thesis suggests that the psychological experiences that follow psychological contract evaluations are key to understanding outcomes, in particular in relation to breach. There was an indirect negative relationship between breach and all positive outcomes through feelings of violation and experiences of cognitive failure (memory lapses, distractions and unintentional gaffes). The indirect relationships with outcomes were positive for fulfilment via

the same mediators. Where unsafe behaviour was concerned, the indirect relationship was positive for breach and negative for fulfilment. In other words, the frequency of safe and unsafe behaviour, such as wearing one's PPE, protecting colleagues from harm, raising safety concerns, and taking chances to get the job done reported by seafarers was explained indirectly by their experience of fulfilment and breach of their psychological contract. There was also a positive indirect relationship between breach and unhealthy behaviour via cognitive failure, indicating that individuals' behaviour, such as alcohol consumption, is also partly explained by their employers' promise-keeping behaviour. These findings confirm other empirical research reporting positive associations with well-being and behaviour for fulfilment (e.g. Conway et al., 2011), and negative associations for breach across a range of outcomes (e.g. Zhao et al., 2007). They also extend the application of PCT to the safety domain and thereby make an important theoretical contribution to our understanding of safety behaviour.

The third important theoretical contribution is in testing the ability of PCT to explain changes in safety behaviour. The longitudinal study contributes in two ways. First, it provides a more robust test of the psychological contract's ability to explain outcomes. This was achieved by testing if changes in evaluations predicted changes in outcomes over initial levels of each. The findings underscore breach's explanatory power (Conway & Briner, 2009) across a range of psychological and behavioural outcomes; changes in breach over a six-month time frame were indirectly related to changes in in-role safety behaviour, safety citizenship towards one's colleagues and organisation via cognitive failure. Additionally, changes in breach were indirectly related to well-being and unsafe behaviour via violation. On the other hand, the findings in respect of fulfilment challenge the often-held assumption that more is better; changes in levels of fulfilment over the six months related to *increases* in cognitive failures. There has been limited empirical research into the effects of fulfilment and consequently it is poorly understood (Conway et al., 2011; Guerrero & Herrbach, 2008). This thesis opens up an avenue of future research by tentatively suggesting that positive changes in fulfilment may tax an individual's resources reducing their capacity to perform safely to the same extent as breach does. It is not clear whether this is a stress response or an indication of complacency.

The fifth and final contribution in relation to Aim 1 comes from the diary study. The daily diary methodology contributes to the evaluation of PCT in three ways. First, it measures fulfilment and breach more precisely. Individuals report events as and when they happen removing any ambiguity as to whether or not their employer is fulfilling its obligations and removing the need to retrieve from memory events that might be evidence of breach. Second, the daily recording of *both* positive and negative events recognises that employers may be good and bad at fulfilling their obligations; it recognises that fulfilment and breach might not be on a continuum; and, it

enables the combined effects of fulfilment and breach to be scrutinised. Third, it presents a more exacting test of PCT in that it tests the ability of PCT to explain an individual's day-to-day performance variation.

At the person level, although not reported in detail, the diary provides further support for the power of breach to explain outcomes, with individuals who experienced more breach events also reporting more feelings of violation, unpleasant mood and cognitive failures as well as more unsafe behaviour than their contemporaries. In other words, breach indirectly explained counterproductive behaviour over a two-week period. Conversely, the diary found that fulfilment failed to explain either productive or counterproductive behaviour. This thesis suggests that pleasant mood, such as feeling cheerful and relaxed, predicts an individual's pro-safe behaviour over the shorter term rather than fulfilment or breach.

This study also found that PCT was partly supported in respect of day-level changes within individuals. Day-level changes in the experience of a breach event predicted concomitant changes in feelings of violation, unpleasant mood and cognitive failures, again highlighting the immediate and deleterious consequences of breach for individuals' psychological well-being. However, the indirect relationship of breach via these adverse psychological states was *positive* in respect of in-role safety behaviour and organisationally-targeted safety citizenship; i.e. productive behaviour increased not decreased as cognitive failures increased. Further, it was *negative* in respect of unsafe behaviour; i.e. counterproductive behaviour decreased not increased as unpleasant mood increased. Fulfilment was unrelated to intra-individual variations in safe or unsafe behaviour. This thesis suggests that the sign of the relationship between psychological contract events and behaviour is different at different levels of analysis. It is the daily diary method that enabled this discovery, which would have otherwise gone undetected in a conventional survey.

Psychological contract theory: a belief in reciprocal obligations

The psychological contract's use in explaining employee behaviour starts in the earliest days of industrialisation, when individuals gave up the craft way of life for an employment relationship. Since then, the concept has developed, drawing on contemporary theoretical paradigms and has been used as a vehicle to understand employee behaviour in a range of contexts, from medical practitioners (Bunderson, 2001) to sales teams (Conway et al., 2011).

One of the intractable problems facing society is to ensure workers are safe as well as productive. Despite this fact and that most individuals engaged in work that is dangerous do so in the context of an employment relationship, the psychological contract has rarely been applied

to understand safety performance. Therefore, its utility in explicating employee safety behaviour is largely untested. This section examines the usefulness of the psychological contract concept for explaining productive and counterproductive behaviour of employees working in a context where they might not feel able to reciprocate in a manner of their choosing.

The first tenet underpinning contemporary psychological contract theory that this thesis addresses is that employees' beliefs in reciprocal obligations arise when employers promise inducements and employees pay for these through their own contributions (Rousseau, 1989, 1995). An employee's role behaviour is a function of the on-going fulfilment of these reciprocal obligations which gives rise to a mental model of the employment relationship and the standards of behaviour expected by employer and employee (Shore & Tetrick, 1994). PCT predicts that the relationship will break down when one or other party reneges on its promises and fails to discharge its obligations (Rousseau, 1989).

This aspect of PCT was largely supported. As expected, fulfilment operates in a similar manner to other work contexts. Individuals who benefit from a good employment relationship are also psychologically healthier and more likely to respond with a positive contribution to their organisation. When one considers the relationship of fulfilment with behaviour via violation, fulfilment's reach appears to extend across the divide of productive and counterproductive behaviours. It was indirectly associated with more organisationally targeted citizenship behaviour and less unsafe behaviour. Indeed, the indirect relationships via violation were significant for all outcomes except unhealthy behaviour. However, there were some findings against hypotheses. For example, in the change score analyses and the diary study fulfilment was associated with exacerbating cognitive failures rather than ameliorating them. This is discussed further in the section on future research.

Turning now to breach, it was consistently associated with poorer health and safety outcomes. Individuals whose agreements are broken report more feelings of violation, more cognitive failures, lower levels of psychological well-being and more unsafe behaviour. When one considers the effects of breach on behaviours via violation and cognitive failure, it becomes apparent just how powerful the belief in reciprocal obligations can be. The negative effects of breach via violation and cognitive failure were associated with withdrawal of *all* pro-safe behaviours as well as increases in unsafe behaviour. Adding weight to the utility of this aspect of PCT was the finding that changes scores were significant for all outcomes too (bar unhealthy behaviour).

The finding that breach directly predicts unsafe behaviour more consistently than discretionary safety behaviour contradicts social exchange theory. It is illogical to suggest that an individual

would prefer to put him or herself at risk rather than harm their employer in order to even the score, yet the results seem to suggest this. The only research found that examines PCT in a safety context suggests that when employers renege on their safety commitments, employees reduce their safety obligations (Walker, 2013). Walker found that it is not employer breach that explains safety behaviour, rather it is an employee's fulfilment of his or her own safety obligations that does. This thesis and Walker's study appear to support one another in that the psychological contract does not regulate behaviour directly. Rather it seems that individuals' own motivational and attentional regulatory mechanisms need to be explored in order to understand why they make the choices they do.

7.2.2 Aim 2: Critically examine PCT as a theory of workplace behaviour and the zone of acceptance governing reciprocal exchanges

The purpose of this aim was to critically examine the zone of acceptance governing reciprocal exchanges to see if AET and EDT could meaningfully explain the limits that govern how employees respond to fulfilment, breach and changes in their psychological contract. Both the survey (Chapter 5) and the diary study (Chapter 6) examined the mediated relationship of fulfilment and breach with outcomes via violation (AET) and cognitive failure (EDT). The summary findings from the survey and diary are presented in Table 7.1.

Three important theoretical contributions emanate from pursuing this aim. Firstly, in support of AET, this thesis consistently found that individuals disaffected with their employer are more likely to experience poorer well-being and increased safety lapses, corroborating research that demonstrates violation's links with emotional exhaustion (e.g. Jamil et al., 2013) and counterproductive behaviour (e.g. Bordia et al., 2008) as well as extending our understanding of affective events to the safety domain.

Second, by drawing on an EDT perspective this thesis adds a unique insight into the damaging effects of breach and violation on an individual's capacity to engage in productive safety behaviour and resist unsafe and unhealthy behaviour. This thesis clearly demonstrates that cognitive deficits accrue when employers let down their employees and such cognitive failures explain a far greater range of outcomes, from reductions in safety compliance to increased alcohol consumption, than violation does. It thereby makes an important contribution to both PCT and EDT, offering unique insights into the cognitive challenges of employer over- and under-fulfilment and extending the latter theory from the laboratory to the field.

The third significant contribution is in respect of contributions made to AET, EDT and our understanding of safety behaviour at the intra-individual level. The diary findings have two important implications. First, concerning fulfilment, there were no discernable effects of

fulfilment on violation or pleasant mood at either the person or day levels. Positive events do not appear to influence affect or behaviour, or are insufficient to counter the negative effects of breach events. Second, in respect of negative events, the diary found that daily reductions in motivation and attention associated with breach events predict *increased* safety performance and *reduced* safety lapses. These findings do not support either theory. They nevertheless enlarge our understanding of the nature of safety behaviour, and, consistent with recent surprises in the personality (Côté et al., 2012) and work performance fields (Miner et al., 2005), demonstrate that safety performance exhibits considerable within-person variability. All told, this thesis highlights the need for further research into the relationships of daily affect and cognition with performance and the often-held assumption that psychological experiences predict work behaviours rather than the other way round.

Table 7.1

Summary of findings across studies in respect of violation, cognitive failures and behavioural outcomes.

Outcome	Violation					
	Cross-sectional		Longitudinal		Diary	
	TI	TII	TI → TII	TII → TII	L2	L1
IRSB	✓	✓	✗	✗	✗	✗
SCBI	✓	✓	✗	✗	✗	✗
SCBO	✓	✓	✗	✗	✗	†
USB	✓	✓	✗	✓	✓	✗
UHB	✗	✓	✗	✗	-	-
Outcome	Cognitive Failure					
	Cross-sectional		Longitudinal		Diary	
	TI	TII	TI → TII	TII → TII	L2	L1
IRSB	✓	✓	✗	✓	✗	†
SCBI	✓	✓	✗	✓	✗	✗
SCBO	✓	✓	✗	✓	✗	†
USB	✓	✓	✗	~	✓	~
UHB	✓	✓	✓	✗	-	-

Notes. ✓ = Significant; ✗ = Non-significant; ~ = Marginally significant; † = Opposite in sign. - = Not assessed. IRSB = In-role Safety Behaviour. SCBI = Safety Citizenship – Individual. SCBO = Safety Citizenship – Organization. USB = Unsafe behaviour. UHB = Unhealthy behaviour.

The final important contribution is made to individual difference theories of self- and emotion-regulation. Personal disposition in respect of self-regulatory goal focus did not seem to have much bearing on individuals' motivation or attention in the context of breach. Rather, the more

developed an individual's skill at preventing emotional disequilibrium was, the lower their experience of violation and cognitive failure was. In respect of emotion regulation, a tendency to use one of two strategies, which might otherwise exacerbate or dampen the experience of violation and cognitive failure, did not appreciably interact with each to influence behavioural outcomes. As with self-regulatory focus, the direct effect of deploying the habitual tendencies was strongly related to outcomes, positive outcomes in the instance of a cognitive change strategy and negative outcomes in the instance of an emotional suppression strategy. These findings highlight the importance of giving consideration to how individuals manage their emotions in a safety-critical context.

The role of affect in predicting outcomes

Broadly speaking, this thesis supports affective events theory and the proposition that psychological contract events invoke affect, which subsequently influences job performance (Weiss & Cropanzano, 1996).

Taking fulfilment first, this thesis corroborates the limited research into fulfilment and demonstrates that it predicts psychological well-being (Guerrero & Herrbach, 2008), relates to reduced negative affect more than increased positive affect (e.g. Vantilborgh, 2015) and its positive effects are weaker than breach's negative effects are (e.g. Conway et al., 2011). However, the longitudinal results did not verify this finding; increases in fulfilment were not associated with lower levels of violation over six-months and individuals reporting positive events in the diary study reported neither reduced violation nor elevated mood either on the day of the event, or over successive days. This thesis failed to find the upper boundary of the zone of acceptance, at least defined in terms of affect.

There were considerable levels of stability in levels of fulfilment, psychological well-being, and pleasant daily mood, which could raise questions about the separation of fulfilment from affective experiences. Certainly, the positive events individuals reported did not seem sufficient inducements to reduce any bad feeling towards their employer or to raise their general mood. The beneficial effects of fulfilment on affective experiences and behaviour appear to accrue over months or years.

By far the greatest predictor of pro-safe behaviour was pleasant daily mood; individuals who were more cheerful and content over the 14 days of the diary study were more likely to report prosocial behaviours. However, this pleasant mood did not appear related to positive psychological contract changes and thus fulfilment may simply reflect a positive attitude to one's employer, which is associated with positive outcomes, rather than determining them.

However, it should be emphasised that the absence of a change effect may be due to methodological failings. In the diary, events and affect were measured concurrently and thus any minor changes pre and post an event may have been missed. Second, given that breach and fulfilment were measured together, it is also entirely possible that positive events induced positive affect, but these were insufficient to compensate for the negative events and negative affect individuals had also experienced. In support of this theorising, the relationship of breach to violation and breach to unpleasant mood remain unchanged when fulfilment was controlled for.

In respect of breach, this thesis endorses the value of this concept in explaining negative affective experiences and counterproductive behaviours in particular. In the cross-sectional samples, breach positively predicted violation confirming a widely reported finding in psychological contract studies (cf. Zhao et al., 2007). However, this thesis also suggests that the distinction between breach and violation warrants closer scrutiny.

Previously, violation and breach were used interchangeably (cf. Rousseau, 1989) but Morrison and Robinson (1997) successfully argued for a distinction on the basis that breach is a belief and violation is an affective reaction. Weiss and Cropanzano (1996) have made a call to researchers to make a distinction between an individual's affective experiences with an object and their beliefs or cognitive evaluations of the object. This thesis suggests that the violation construct contains both cognitive and affective components and thus its distinction from breach may not be so clean. The reasons for this supposition are twofold.

First, in the longitudinal study, breach demonstrated as much as 60% of the change in violation was associated with change in breach. Thus, there appears considerable overlap between the two constructs. Second, in the diary study, the between-person relationship (diary) of breach to violation was significant whereas the between-person relationship of breach to unpleasant mood was not. If violation were no more than an affective reaction, it ought to be as temporally unstable as unpleasant mood and demonstrate no between-person relationship with breach. On the other hand, supporting the argument that violation is a transitory affective reaction to breach, the day level relationship of breach to violation was significant as was the day level relationship of breach to unpleasant mood. Thus, this thesis raises doubts as to the separation of breach from violation on the basis one is a belief and the other is an affective experience. Recent advances in neuroscience suggest that thoughts and feelings are closely bound together in associative neural networks (Barsade et al., 2009). This would appear to be true of breach and violation.

In terms of behaviour, as ventured by Weiss and Cropanzano (1996), this thesis proposes that affective events, such as breach, have a disrupting influence on behaviour via the bad feeling they are associated with. However, this may only be true in relation to counterproductive behaviours. The diary study failed to support the theory that affective events disrupt productive as well as facilitate counterproductive behaviour. The implication of this latter finding is that affect following a breach perception does not disrupt the motivation to perform, as control theory would suggest. According to this thesis, the lower limit of the zone of acceptance or limit of tolerance is not governed by schema in semantic memory. Rather, these findings would imply that breach is an autobiographical episode that gets encoded as such into episodic memory simultaneously with the affective experience associated with it. In the cognitive neuro-science literature, a distinction is made between semantic memory (schema) and episodic memory (events) (Tulving, 1972). A schema develops from multiple episodes that bear some similarity. A new episode, or event, cannot guide behaviour because it has no pre-existing schema into which it can be encoded and from which a script and appropriate action plan can be generated (Ghosh & Gilboa, 2014). Therefore, a breach event cannot activate a schema and direct behaviour. Further, it is difficult to envisage the psychological contract schema that suggests increased risk-taking is the behaviour that follows when an employer fails to honour its obligations, and further, to imagine how increased unsafe behaviour can be an appropriate or logical response to breach in a safety-critical situation. Muraven and Baumeister (2000) have also queried control theory's account of schemata induced behavioural withdrawal. They assert that activation of a schema ordinarily facilitates behaviour making performance better, not worse.

This thesis holds that a breach event is assessed in relation to other autobiographical events, not in relation to the schema of the psychological contract thereby supporting the clinical view of breach rather than the cognitive one (cf. Meckler et al., 2003) and intimates that affect is a companion or even precursor to breach, not a consequence (cf. Zajonc, 1980). On this basis, it is reasonable to suppose that breach is related in memory to other emotionally distressing events that likely antedate the employment relationship (cf. Levinson et al., 1962) and is not related to the schema of the psychological contract encoded in semantic memory.

The role of attention in predicting outcomes

The pattern of findings across the two studies generally support an ego depletion account of behaviour associated with fulfilment and breach of the psychological contract; namely, that individual's performance is contingent on their attentional capacities which are depleted by stress and negative emotions (Muraven & Baumeister, 2000). This thesis makes two significant

contributions to psychological contract theory and a significant contribution to the safety performance literature. First, it measures cognitive deficits arising from, as opposed to cognitive evaluations of the exchange, and thereby gives a unique window into the attentional capacities of individuals and how these are influenced, unconsciously, by fulfilment and breach of the psychological contract. Second, it challenges the belief that fulfilment is always good for employees; and, third, it demonstrates that safety behaviour is subject to within-person variation.

The finding that fulfilment is largely stable over six months is in line with predictions from PCT and the emphasis on schema that once formed serve to “extract commonalities” in new experiences (Ghosh & Gilboa, 2014, p. 106). However, on examining the change scores, the finding that increases in fulfilment indirectly associate with *a reduction* in pro-safe behaviours contradicts the precepts of control theory that an unanticipated benefit should cause individuals to increase their efforts. This thesis suggests that positive changes in fulfilment either tax or make an individual indolent, reducing their capacity to perform.

The central tenet of EDT tested in this thesis is that stress and negative emotions deplete an individual’s executive control system, hijacking their attention resulting in vigilance errors and self-control failures, thereby compromising their capacity to persist at behaviours they should engage in, and resist those they should not engage in. Addressing the findings in respect of breach, this thesis confirms research that suggests breach and is associated with strain (e.g. Gakovic & Tetrick, 2003), reduced proactivity (e.g. Bal et al., 2011) and self-control failure (e.g. Restubog et al., 2015)

This thesis goes further than previous research and offers an explanation of how changes in behaviour are brought about. Breach was associated with attentional deficits in the second cross-sectional sample; it predicted the change scores of cognitive failure in the longitudinal study; and, the cumulative effects of breach events were associated with attentional deficits in the diary study when the effect of fulfilment was excluded. Where there was no significant direct relationship between breach and cognitive failure, distractions and blunders were still manifest in relation to breach, but indirectly through violation and unpleasant mood.

In respect of behaviour, the cross-sectional results indicate that over the longer term, attentional deficits associated with breach are predictive of a greater range of outcomes than violation, including withdrawal of pro-safe behaviour, engagement in unsafe behaviour, and participation in unhealthy behaviours such as smoking, which is indicative of self-control failure. The longitudinal results suggest that, over a six-month time frame, the most important consequence of breach is a reduced *attentional capacity* to engage in productive safety

behaviour, such as following procedures. This thesis suggests that the zone of acceptance is in fact a zone of capacity; individuals would appear to withdraw pro-safe behaviour as attentional disruption reduces their ability to maintain on-task attention. In this respect, the indirect effects of breach on behaviour appear to indicate the limit of an individual's tolerance is attentional not volitional.

There are two points at which the findings depart from those predicted; first, in respect of the relationship between fulfilment and cognitive failure; and, second in terms of the relationship between cognitive failure and safety behaviour in the diary study. The greatest challenge for PCT came from the findings in respect of fulfilment; individuals who experienced increases in the extent to which their employer had over-fulfilled its obligations, the more individuals exhibited cognitive failures. Contrary to a "broaden-and-build" hypothesis (Fredrickson, 2001), fulfilment appears to tax individuals' attentional resources not increase them, corroborating Conway and Briner's (2002, 2009) call to treat over-fulfilment as breach. In terms of the upper limits of the zone of acceptance, it appears to be defined in terms of capacity to respond not motivation to respond, undermining Schalk and Roe's (2007) proposals.

The second point of departure from theory and predictions comes in the results of the diary study. Contradicting the longitudinal study, in the diary study, cognitive failures were associated with increased unsafe behaviour not reduced pro-safe behaviours. If Hockey et al.'s (2000) propositions were true that risky behaviour only becomes evident when resources have already been consumed maintaining prescribed behaviour, then we should expect discretionary safety behaviour to exhibit a relationship with cognitive failures rather than unsafe behaviour. Similarly, if a social exchange account were true, we would expect individuals to target their disquiet at the organisation rather than jeopardise the safety of themselves and their colleagues. Instead, it would appear that the attentional pull of the task (Beal et al., 2005) rather than its prescription or prohibition determines if it will be maintained when attentional resources are depleted; the more mundane tasks of following rules and avoiding short-cuts appear to be particularly susceptible to ego depletion in the shorter-term.

Thus, this thesis provides tentative support for an ego depletion account of the zone of acceptance confirming Muraven and Baumeister's (2000) proposal that stress and managing aversive emotions are ego depleting. Second, it extends this theory from the laboratory to the field, thereby demonstrating that depletion of the executive control function is associated with withdrawal of meaningful work tasks as well as contrived laboratory activities.

The unfolding psychological contract and within-person variability of safety behaviour

This thesis makes two important contributions to psychological contract theory as well as AET and EDT. There are three points worth making. First, psychological contracts are rarely studied at the point of occurrence of a fulfilment or breach event. Thus, by studying daily events this thesis adds to the limited body of knowledge regarding the unfolding psychological contract.

Second, explanatory frameworks tend to assume that psychological experiences precede and predict behaviours (cf. Morrison & Robinson, 1997; Shore & Tetrick, 1994) with positive experiences relating to positive outcomes and negative experiences to poor outcomes. This thesis found that both violation and cognitive failure were related to positive outcomes and unpleasant mood to reduced negative outcomes.

Third, safety behaviour is almost exclusively conceived of as an individual difference phenomenon. This thesis challenges this received wisdom and demonstrates that safety behaviour exhibits as much as 34% variation on a day-to-day basis. This thesis ventures that we need to adopt an employee-centric, as opposed to employer-centric, perspective of behaviour to understand how and why individuals make a net contribution or loss to their organisation's performance (cf. Dalal, 2005). The finding that breach events indirectly predicted daily *increases* in pro-safe behaviours and *reductions* in unsafe behaviours suggest that behaviours serve an adaptive function to alleviate distress and manage limited cognitive resources rather than to reciprocate their organisation's actions. Further research is warranted into the function that behaviour has for affect and attention.

The role of self-regulatory focus and emotion regulation in understanding the effect of breach and fulfilment on safety behaviour

Finally, it was expected that self-regulatory focus and emotion-regulation strategies would moderate an individual's reactions to breach as well as moderate the effects of violation and cognitive failure on behaviour. This was largely not borne out. The only significant moderation of breach was when a prevention-oriented regulatory focus was low the relationship between breach and violation was stronger.

Emotion-regulation strategy moderated the effect of violation and cognitive failure on safety citizenship and unsafe behaviour. When individuals engaged in cognitive reappraisal, the effect of cognitive failure on organisationally targeted safety citizenship was weaker. This strategy increased their capacity to behave safely. When individuals engaged in emotion suppression, the relationship between violation and unsafe behaviour was stronger. This strategy decreased their motivation to follow rules.

However, by far the strongest relationships were direct from self-regulatory focus or strategy to the outcome. The fact that a prevention-oriented focus predicts lower levels of violation and cognitive failure supports research that finds individuals who have learnt to keep their emotions under control fare better in a safety-critical environment (Wallace & Chen, 2006; Wallace & Vodanovich, 2003b). The fact that an emotion-regulation strategy based on reappraisal positively predicts safety performance and a strategy based on emotional suppression negatively predicts safety performance adds to the emotional labour field, extending the findings from a customer-service environment (Grandey, 2003) to a safety-critical environment.

7.3 Methodological contribution

This section briefly comments on the methodological contribution of each of the studies. Firstly, psychological contract research has been criticised for deploying cross-sectional designs to assess dynamic processes, and, for adopting an atheoretical, bivariate approach to the examination of constructs (e.g. Conway & Briner, 2009). This study used a two-wave longitudinal design to assess change scores, examined two theoretically derived mediation processes, and applied structural equation modelling (SEM) to the analysis of both measurement and structural relations in the data.

A change score approach (Finkel, 1995) gives greater confidence in inferences about causality than is possible in cross-sectional designs because initial levels of variables are controlled for enabling the effect of change in the predictor on change in the dependent variables to be assessed over a given time period. The strength of SEM over other regression analyses is in its ability to model measurement error separately from the relationships between latent variables (Byrne, 2013). In so doing, SEM assesses the construct validity of the latent factors as well as the veracity of the structural relations in the data. A further strength of this thesis's study design was the ability to assess the invariance of the hypothesised model on two independent samples from the same population. This enabled structural relations to be calibrated in one sample and validated on the second thereby giving greater assurance of the validity of the hypothesised model.

Lastly, the use of a daily diary methodology is novel in safety studies and rare in psychological contract studies. Both fields have made implicit methodological assumptions about the stability of psychological phenomena through their preferred cross-sectional survey design. A diary study is particularly valuable in capturing working life as it is lived (Bolger et al., 2003) as well as momentary psychological phenomena such as affect (Beal & Ghandour, 2011). Therefore, this

study adds unique insights into the unfolding psychological contract and the psychological experiences associated with it. It also expands our understanding of safety behaviour demonstrating that it too is subject to considerable intra-individual variation on a daily basis as individuals adapt to their affective state and cognitive resources.

7.4 Limitations and recommendations

The empirical chapters (Chapters 5 and 6) discussed the limitations that apply to the survey and diary studies. This section discusses the limitations that apply to the entire research programme presented in this thesis from which recommendations for future research flow.

Limitation 1: Contemporary PCT adopts an information-processing conceptualisation of fulfilment and breach, emphasising reciprocal promissory obligations as the foundations of the psychological contract and emphasising the role of schema and scripts in guiding work behaviour. The findings of this thesis suggest that breach might be different in kind to fulfilment in terms of the strength and nature of the relationships with outcomes. However, in the longitudinal survey, while the breach measure used was consistent with that validated in multiple studies heretofore, this thesis found that the reverse-scored items from Morrison and Robinson's (2000) scale did not load sufficiently onto the breach factor. Therefore, the breach construct was under-represented given it was only measured by two items.

Recommendation 1: Future research should test the idea that the definition of breach needs to be updated to take account of advances in neuroscience and the understanding of the formation and activation of associative neural networks. In order to do so, the operationalisation of breach should only contain items that refer to episodes where the organisation has broken its side of the deal and not reverse-scored fulfilment items.

Limitation 2: The studies presented here revealed considerable stability in positive psychological experiences. However, in the longitudinal study, fulfilment did not predict violation, and, in the diary study fulfilment did not predict pleasant mood although pleasant mood predicted pro-safe behaviour. Given the finding that breach predicts negative affect, which predicts counterproductive behaviour, it is reasonable to suppose that fulfilment might predict the positive affect that in turn predicts productive behaviour. The inability of this thesis to predict positive affect from fulfilment is likely the consequence of methodological failings. The survey did not measure positive affect as a mediator of the fulfilment-behaviour relationship. Further fulfilment, affect and behaviour were all measured concurrently in the diary study.

Recommendation 2: Some limited research has tested the proposition that fulfilment is distinct from affect (Guerrero & Herrbach, 2008) and positive events are related to positive emotions (Conway & Briner, 2002), but more robust designs are needed before definitive conclusions can be made about the positive emotional experiences associated with fulfilment. Future research should therefore seek to use sampling methods that capture momentary changes in positive affect having first controlled for mood at the start of the working day to ascertain whether changes in affect are related to positive events. Additionally, measures of positive affect should be deployed in cross-sequential designs with at least three waves to ascertain the speed and shape of changes (Pitariu & Ployhart, 2010) associated with fulfilment over the longer term.

Limitation 3: While this thesis has employed multiple measures of safety behaviour, it only employed one method; namely, self-report. Further it rested on the methodological assumption that psychological experiences precede behaviour and therefore could not explain the reverse sign relationships in the day-level analyses.

Recommendation 3: Future research should ascertain whether a performance-protection strategy (Hockey, 1993) or mood improvement (Glomb et al., 2011) explains the within-person improvements in safety behaviour associated with cognitive failure and low mood. To detect the direction of the effect, the frequency and timing of assessments is key (Miner & Glomb, 2010). Thus any future research would benefit from a diary design employing quasi-random interval sampling of mood and cognitive function through the course of the day as well as baseline measures at the start of the day (Glomb et al., 2011). Supplementing self-report with objective measures of performance would further strengthen the research design.

7.5 Future research

In addition to future research arising from the limitations of the research programme, this section offers suggestions for further research avenues in respect of PCT, AET, EDT and safety behaviour.

7.5.1 Developing the concepts of fulfilment and breach

One of the contributions of this thesis was to highlight the distinctiveness of breach from fulfilment, but there is a need to investigate this further. This section proposes two ways in which these concepts might be taken forward.

In the first instance, the concepts of fulfilment and breach would benefit from being updated by taking advantage of advances in affective-neuroscience, in particular our understanding of memory structures and how experiences are stored and retrieved on the basis of whether they

are semantic (linguistic) or episodic (autobiographical) in nature (e.g. Tulving, 1972, 2002). Neuroscientific studies have established that these different memory systems serve different functions. Semantic memory's role is, in part, to enable individuals to memorise facts, make logical deductions and understand ideas (Tulving, 1972), whereas autobiographical memory serves, amongst others, a social and directive function helping individuals to cultivate social relationships and prevent them from repeating bad experiences (Waters, Bauer, & Fivush, 2014).

One of the most contentious issues in contemporary PCT is whether a clinical or cognitive account better represents how the psychological contract operates. In the chapter on PCT, a discussion regarding different paradigmatic conceptualisations of the psychological contract concluded that both Mecklar et al. (2003) and Rousseau (2003) may be right about how new information regarding the employment relationship is evaluated and influences behaviour. The former emphasised unconscious needs, which may predate the employment relationship, and the latter cognitive schema that are contemporaneous to it. While Rousseau's treatise on schema (2001) has largely held sway over the academic community, a lack of reference to episodic or autobiographical memory and its role in evaluations of exchange events represents an omission in her account.

This thesis found that fulfilment and breach are likely different in kind as well as effect. Fulfilment appears to conform to contemporary psychological contract theory, which suggests that associations learnt between promises made and inducements delivered direct on-going behaviour; new events that conform to what has already been learnt are assimilated into existing memory structures (Rousseau, 2001). Events that are more dissimilar are accommodated as long as they do not disrupt the existing relationship (Schalk & Roe, 2007). In the longitudinal survey, fulfilment was largely stable over a period of six months and in the diary study daily positive events failed to explain violation or mood. However, changes in fulfilment were positively related to changes in cognitive failures. The finding that changes in levels of fulfilment are associated with cognitive failures leads to the proposition that this relationship may be indicative of accommodation processes at work. According to Ghosh and Gilboa (2014), accommodation is difficult to capture and is yet to be studied. Studying fulfilment-cognitive failure relationships over multiple waves would enable this proposition to be tested to ascertain if the relationship stabilises after changes (over fulfilment) have been accommodated.

Conversely, breach may be more autobiographical in nature; individuals draw on memories of personal events to interpret what is *happening* to them rather than semantic memory to

establish what they should do in response to breach of their employment relationship. The finding that perceptions of breach are very closely tied to feelings of violation, that violation does not exhibit stability over the longer term, and individuals appear to reciprocate breach with illogical, unsafe behaviour suggests that episodic memory might be being triggered, the defining features of which are its early-deteriorating nature (Tulving, 2002, p. 5) and its activation by distressing experiences (Waters et al., 2014). Understanding more about the process of episodic memory activation in an employment relationship would shed light on ways and means to mitigate the negative consequences of breach.

7.5.2 Developing an employee-centric view of safety behaviour

This thesis made a number of observations that are inconsistent with the theories utilised in this research and thus warrant further investigation. This thesis suggests a number of avenues worth exploring consistent with an employee-centric view of behaviour (Dalal, 2005).

The first observation that suggests an employee-centric account was the finding that safety behaviour shows marked within-person variation, and at the day-level, relationships of affect and attention with both productive and counterproductive safety behaviour are counterintuitive. The presumption in AET and EDT that positive affect facilitates and negative affect disrupts behaviour was not borne out in the intra-individual results. This presumption is also implicit in the safety literature; for example, transformational leaders are studied to understand their effects on employee safety participation through trust (e.g. Conchie et al., 2012); and, features of the environment, such as job demands are studied to understand how stress predicts safety withdrawal (e.g. Tucker et al., 2009). Contrarily, this thesis suggests that daily safety behaviour might be *antecedent* to daily mood and attentional resources and may vary consonantly with the attentional pull of the task (cf. Beal et al., 2005) rather than the vagaries of the employer's behaviour.

Rather than the employers making employees feel good who then do good, it appears that when employees feel bad, they do good to feel better (Glomb et al., 2011) rather than to please their employer. Similarly, when employees feel bad, they withdraw to get some respite and recover their spent resources (Sonnentag, 2003) rather than to be Machiavellian. Studying the function that the behaviour serves would enable considerable progress to be made in targeting appropriate interventions to improve safety standards, such as employee assistance rather than remedial training.

An individual difference account of safety behaviour pervades the safety science literature despite the equivocal findings with respect to personality and safety outcomes in recent meta-analyses (Christian et al., 2009; Clarke & Robertson, 2008, 2005) and the finding that

personality is subject to intra-individual variation (Judge, Simon, Hurst, & Kelley, 2013). The quest to find the accident-prone personality continues drawing on the Big Five model (cf. Beus et al., 2015), but this thesis suggests that a more fruitful path may be to consider the emotional regulation literature and how different emotion-regulation strategies impact safety outcomes.

The final observation that prompts the consideration of an employee-centric avenue is the finding that positive affect and emotion regulation are strong positive predictors of productive safety behaviour at the between-person level, but not the within-person level. Given the finding that productive safety behaviour varies intra-individually by as much as 34%, the question remains as to the nature of the within-person antecedents of a positive safety contribution. The suggestion arising from this thesis is that emotional stability may hold the key in predicting how susceptible individuals are to both affirming and discombobulating events.

Safety studies' reliance on central tendency measures of traits means that the variability of those indicators within a person and the relationships the variability or stability might have with behaviour get overlooked (cf. Côté et al., 2012). Known as affect spin, individuals' affect variability appears to be a trait in its own right, with high and low spinners exhibiting considerable variation or stability respectively (Eid & Diener, 1999). High spinners are more reactive to positive and negative events and therefore show day-to-day variation in positive affect whereas low spinners do not (Beal & Ghandour, 2011). Further, low spinners do not consume as many precious attentional resources when regulating their emotions after a taxing day (Beal et al., 2013). Therefore, the concept of affect spin warrants further consideration in a safety context. It may account for the absence of consistent relationships between trait affect and safety behaviour in the extant literature and the absence of within-person relationships between positive affect and fulfilment in this study.

7.6 Implications for practice

This thesis's findings have several important implications for practitioners seeking to ensure workers are safe as well as productive. Firstly, PCT has demonstrated its value in understanding employee behaviour in a wide range of contexts and has attracted much attention culminating in Conway and Briner's monograph in 2005 and their critical review in 2009. Conway and Briner single out the concept of psychological contract breach as a particularly useful construct demonstrating in their own research that emotional reactions can be as strong as an argument with one's spouse (Conway & Briner, 2002). This thesis confirms their sentiments and commends PCT as a theory of workplace *safety* behaviour and in particular, the concept of breach as an important vehicle for understanding employees'

motivation to violate safety rules and for understanding their capacity to maintain their focus on their safety responsibilities. In practical terms, the obligations that appear to matter most for employees engaged in safety-critical work, although important, are not those to do with pay or providing adequate safety resources, rather they are to do with satisfaction of relational obligations, such as being treated with trust and respect. The benefits that accrue from so doing is a work force that benefits from good psychological health and a resilience to minor ups and downs in their employment relationship. However, an important caveat arising from this thesis is more fulfilment is not necessarily better where individual's attentional resources are concerned. The key message for employers therefore is to focus on developing their relationship with their employees and to mitigate the negative consequences of changes through diligent change management practices that reduce threat appraisal (Fugate, Prussia, & Kinicki, 2012), even when those changes may be presumed to be desirable.

Secondly, the findings with respect to the consequences of breach for affect and attention and subsequent safety behaviours both in the long- and the short-term have implications for the HRM practices of the organisation and the way in which performance is managed and rule violations are investigated and dealt with. The finding that ego depletion is a likely explanation of why employees withdraw behaviours such as following procedure, wearing PPE, looking out for their colleagues' safety and speaking up about safety problems, suggests that a fruitful avenue to pursue in managing employee safety performance is to address and mitigate the sources of stress in an employee's employment relationship. This points to employers maximising the opportunities to openly negotiate the psychological contract and take account of employees' needs and aspirations in the performance review and employee development processes (cf. Sturges et al., 2005).

The consistent finding that breach is associated with unsafe behaviour through its effects on an employee's anger, frustration and mood suggests that blaming employees for their safety lapses and punishing them for their mistakes is likely to compound not alleviate the problem of rule-violating behaviour. Low mood and high arousal are disturbing for individuals, which they are strongly motivated to alleviate (Berkowitz, 1993; Spector & Fox, 2002). The diary study showed that the relationship between mood and counterproductive behaviour is not straightforward but indicative that mood improvement may be the motivation underlying unsafe behaviour, not retaliation or deviance. Organisations should therefore monitor the mental health of their employees in order to mitigate safety lapses and consider the sources of distress underlying any adverse occurrence in accident investigations.

Lastly, the diary study demonstrated that the employment relationship is dynamic and inevitably there will be ups and downs; employers are not 100% reliable and employees are not always good at managing their emotional reactions. The finding in the survey and diary that individuals' emotion regulation strategies are highly predictive of their safe and unsafe behaviour warrants organisations taking steps to assist individuals to develop and apply emotion regulation strategies that reinterpret events rather than suppress emotional responses.

7.7 Conclusion

This thesis contributes significantly to our understanding of employee health and safety behaviours in the context of an employment relationship. First, it is important to remind ourselves that the reason it is imperative to study workplace safety is because so many people are harmed and killed at work. We know that the withdrawal of behaviour in a safety-critical context can have catastrophic repercussions compared to benign environments where hazards are low. In safety contexts, it is not a trivial matter when an employee violates rules or ignores a misdemeanour of a colleague. The second important reminder is that we need to understand why employees do what they do, without being pejorative, so that we can intervene effectively and prevent harm.

The first important conclusion of this thesis in this regard is that the psychological contract appears to be an important vehicle for understanding employee health and safety behaviour and its withdrawal, in particular, the concept of breach. This research supports numerous studies that demonstrate that when employers let their employees down, there are negative consequences in terms of well-being, adherence to role prescriptions, supportive and helpful behaviours towards one's colleagues, assertiveness and initiative on behalf of one's employer, and the side-stepping of organisational rules. The empirical programme also corroborated limited research that suggests fulfilment is good for employees' welfare, helping to reduce angst and aggravation in the workplace as well enabling employees to make a positive safety contribution.

The second important conclusion is that through the dual lenses of AET and EDT we are able to understand *why* employees do the things they do and the role the employment relationship plays in this process. This thesis showed that there are strong relationships between detecting a breach and experiencing a sense of frustration and anger at one's employer across different timespans. There was a repeated finding that the more disaffected individuals were the more rule-violating behaviour surfaced; their motivation to engage in behaviours that are time-consuming but vital to protect everyone's safety was compromised. This supports popular

thinking that events at work are particularly important sources of affect and it is the affect that impacts behaviour. Yet AET did not account for all the relationships with counterproductive behaviour. At the day-level, affective experiences that should be damaging to safety behaviour in fact enhanced it. While methodological limitations may underlie this finding, the alternative, employee-centric perspective of events sees the affect as contingent on the behaviour, rather than the other way round; i.e. it is not volitional deviance, it is adaptive withdrawal.

This thesis also offered a unique insight into the unconscious processes at play when employers renege on their commitments. Uniquely, it would appear, it applies EDT to our understanding of individuals' capacity to persist at behaving safely and desist from behaviours and habits that are unhealthy as well as unsafe. Breach predicted directly and indirectly the attentional disruptions individuals suffer when they have to exercise self-control and maintain on-task attention when stressed or distressed. These cognitive failings explained the variance in a far greater range of behaviours than violation did. Particularly noteworthy, was the finding that increases in cognitive failures predicted withdrawal of pro-safe behaviours. Employees lose the *capacity* to make a safety contribution when their employer misbehaves. Interestingly, this capacity is also compromised when their employer is overly benevolent leading to the suggestion that coping mechanisms are taxed in both situations. Once again, the limits of explanation were reached when it came to day-level results. Cognitive failures predicted a better safety performance.

This thesis also pointed the way to future research that may help resolve the vexed question of the accident-prone personality. Emotion regulation and emotional stability appear to be important drivers of productive safety behaviour. Both appear to have a direct influence and not a moderating influence as modelled in this thesis. Expansion of the personality-safety research area to take account of concepts such as affect spin and its interactions with emotion regulation processes may show that emotional disequilibrium is key to understanding the accident-prone profile.

In summary, this thesis provides convincing evidence for a dual-pathway model of employee safety behaviour that future research should seek to replicate and build upon if we are to reduce the prevalence of harm in our workplaces. Examining fulfilment and breach of the psychological contract along with process and individual difference theories it investigated both the personal and the situational determinants of safety behaviour.

The final important conclusion is that stability appears to be the key, whether that's stability in the employment relationship or the individual's ability to maintain emotional stability; volatility in people and change in situations appear to be the underdoing of a good safety performance compromising individuals' willingness and capacity to behave safely through its effects on motivation and attention.

References

- Abelson, R. P. (1981). Psychological status of the script concept. *American Psychologist*, *36*(7), 715–729.
- Adams, J. S. (1965). Inequity in social exchange. *Advances in Experimental Social Psychology*, *2*, 267–299.
- Ahola, K., Salminen, S., Toppinen-Tanner, S., Koskinen, A., & Väänänen, A. (2013). Occupational burnout and severe injuries: An eight-year prospective cohort study among Finnish forest industry workers. *Journal of Occupational Health*, *55*(6), 450–457.
- Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. California: Sage.
- Alderton, T. (2004). *The global seafarer: Living and working conditions in a globalized industry*. Geneva: International Labour Organization.
- Alderton, T., & Winchester, N. (2002). Globalisation and de-regulation in the maritime industry. *Marine Policy*, *26*(1), 35–43.
- Alliger, G. M., & Williams, K. J. (1993). Using signal-contingent experience sampling methodology to study work in the field: a discussion and illustration examining task perceptions and mood. *Personnel Psychology*, *46*(3), 525–549.
- Allison, P. D. (2003). Missing Data Techniques for Structural Equation Modeling. *Journal of Abnormal Psychology*, *112*(4), 545–557.
- Alper, S. J., & Karsh, B.-T. (2009). A systematic review of safety violations in industry. *Accident Analysis & Prevention*, *41*(4), 739–754. <https://doi.org/doi:10.1016/j.aap.2009.03.013>
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423.
- Andersson, L. M., & Pearson, C. M. (1999). Tit for tat? The spiraling effect of incivility in the workplace. *Academy of Management Review*, *24*(3), 452–471.
- Arbuckle, J. (2007). *Amos 16.0 user's guide*. Spss Chicago, IL.
- Argyris, C. (1960). *Understanding Organizational Behavior*. Homewood, IL: Dorsey Press.
- Arnold, J., Robertson, I. T., & Cooper, C. L. (1991). *Work Psychology: Understanding human behaviour in the workplace*. Harlow: Financial Times/Prentice Hall.
- Ashford, S. J., Lee, C., & Bobko, P. (1989). Content, cause, and consequences of job insecurity: A theory-based measure and substantive test. *Academy of Management Journal*, *32*(4), 803–829.
- Atkinson, J. (1984). Manpower strategies for flexible organisations. *Personnel Management*, *16*(8), 28–31.

- Austin, J. T., & Villanova, P. (1992). The criterion problem: 1917–1992. *Journal of Applied Psychology, 77*(6), 836–874.
- Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the job demands-resources model to predict burnout and performance. *Human Resource Management, 43*(1), 83–104.
- Bal, P. M., De Cooman, R., & Mol, S. T. (2011). Dynamics of psychological contracts with work engagement and turnover intention: The influence of organizational tenure. *European Journal of Work and Organizational Psychology, 22*(1), 107–122.
<https://doi.org/10.1080/1359432X.2011.626198>
- Bal, P. M., De Lange, A. H., Jansen, P. G. W., & Van Der Velde, M. (2008). Psychological contract breach: A meta-analysis of age as a moderator. *Journal of Vocational Behavior, 72*, 143–158.
- Bal, P. M., & Kooij, D. (2010). The relations between work centrality, psychological contracts, and job attitudes: The influence of age. *European Journal of Work and Organizational Psychology, 20*(4), 497–523. <https://doi.org/10.1080/13594321003669079>
- Bal, P. M., & Smit, P. (2012). The older the better! Age-related differences in emotion regulation after psychological contract breach. *The Career Development International, 17*(1), 6–24.
- Bandura, A. (1977). *Social learning theory*. NJ: Prentice Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(9), 1175–1184.
- Barling, J., & Hutchinson, I. (2000). Commitment vs. Control-based Safety Practices, Safety Reputation, and Perceived Safety Climate. *Canadian Journal of Administrative Sciences/Revue Canadienne Des Sciences de l'Administration, 17*(1), 76–84.
- Barling, J., Kelloway, E. K., & Iverson, R. D. (2003a). Accidental outcomes: Attitudinal consequences of workplace injuries. *Journal of Occupational Health Psychology, 8*(1), 74–85.
- Barling, J., Kelloway, E. K., & Iverson, R. D. (2003b). High-quality work, job satisfaction, and occupational injuries. *Journal of Applied Psychology, 88*(2), 276–283.
- Barling, J., Loughlin, C., & Kelloway, E. K. (2002). Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology, 87*(3), 488–496.
- Barling, J., & Zacharatos, A. (1999). High performance safety systems: Ten management practices to create safe organizations. Presented at the Academy of Management meeting, Chicago.
- Barnard, C. I. (1938). *The Functions of the Executive*. Cambridge, MA: Harvard University Press.
- Barsade, S. G., Brief, A. P., & Spataro, S. E. (2003). The affective revolution in organizational behavior: The emergence of a paradigm. In J. Greenberg (Ed.), *Organizational Behavior:*

- The State of the Science* (Second, pp. 3–50). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Barsade, S. G., & Gibson, D. E. (2007). Why does affect matter in organizations? *The Academy of Management Perspectives*, 21(1), 36–59.
- Barsade, S. G., Ramarajan, L., & Westen, D. (2009). Implicit affect in organizations. *Research in Organizational Behavior*, 29(0), 135–162. <https://doi.org/10.1016/j.riob.2009.06.008>
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. Collier Macmillan.
- Bass, B. M., & Avolio, B. J. (1994). Transformational leadership and organizational culture. *The International Journal of Public Administration*, 17(3–4), 541–554.
- Baumeister, R. F. (2001). Ego depletion, the executive function, and self-control. In B. W. Roberts & R. Hogan (Eds.), *Personality psychology in the workplace* (pp. 299–316). Washington, DC US: APA Books.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5(4), 323.
- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego Depletion: Is the Active Self a Limited Resource? *Journal of Personality & Social Psychology*, 74(5), 1252–1265. <https://doi.org/Article>
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation*. San Diego, California: Academic Press.
- Baumeister, R. F., & Vohs, K. D. (2007). Self-Regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, 1(1), 115–128.
- Beal, D. J., & Ghandour, L. (2011). Stability, change, and the stability of change in daily workplace affect. *Journal of Organizational Behavior*, 32(4), 526–546. <https://doi.org/10.1002/job.713>
- Beal, D. J., Trougakos, J. P., Weiss, H. M., & Dalal, R. S. (2013). Affect spin and the emotion regulation process at work. *Journal of Applied Psychology*, 98(4), 593.
- Beal, D. J., & Weiss, H. M. (2003). Methods of Ecological Momentary Assessment in Organizational Research. *Organizational Research Methods*, 6(4), 440–464.
- Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An Episodic Process Model of Affective Influences on Performance. *Journal of Applied Psychology*, 90(6), 1054–1068.
- Belcher, P. (2003). *Women seafarers: Global employment policies and practices*. Geneva: International Labour Organization.
- Bentler, P. M. (1988). Causal Modeling via Structural Equation Systems. In J. R. Nesselroade & R. B. Cattell (Eds.), *Handbook of Multivariate Experimental Psychology* (pp. 317–335). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4613-0893-5_9
- Bentler, P. M. (1995). *EQS structural equations program manual*. Multivariate Software.

- Berkowitz, L. (1993). *Aggression: Its causes, consequences, and control*. McGraw-Hill Book Company.
- Beus, J. M., Dhanani, L. Y., & McCord, M. A. (2015). A meta-analysis of personality and workplace safety: Addressing unanswered questions. *Journal of Applied Psychology, 100*(2), 481.
- Beus, J. M., McCord, M. A., & Zohar, D. (2016). Workplace safety: A review and research synthesis. *Organizational Psychology Review, 6*(4), 352–381.
- Beus, J. M., Payne, S. C., Bergman, M. E., & Arthur, W. (2010). Safety climate and injuries: An examination of theoretical and empirical relationships. *Journal of Applied Psychology, 95*(4), 713–727.
- Bindl, U. K., Parker, S. K., Totterdell, P., & Hagger-Johnson, G. (2012). Fuel of the self-starter: How mood relates to proactive goal regulation. *Journal of Applied Psychology, 97*(1), 134.
- Bindl, U., & Parker, S. K. (2010). *Proactive work behavior: Forward-thinking and change-oriented action in organizations* (Vol. 2). American Psychological Association Washington, DC.
- Blau, P. M. (1964). *Exchange and Power in Social Life*. New York: Wiley.
- Bliese, P. D., & Ployhart, R. E. (2002). Growth modeling using random coefficient models: Model building, testing, and illustrations. *Organizational Research Methods, 5*(4), 362–387.
- Blumberg, M., & Pringle, C. D. (1982). The missing opportunity in organizational research: Some implications for a theory of work performance. *Academy of Management Review, 7*(4), 560–569.
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54*(1), 579–616.
- Borch, D. F., Hansen, H. L., Burr, H., & Jepsen, J. R. (2012). Surveillance of maritime deaths on board Danish merchant ships, 1986–2009. *Int Marit Health, 63*(1), 7–16.
- Bordia, P., Restuborg, S. L. D., & Tang, R. L. (2008). When employees Strike Back: Investigating Mediating Mechanisms Between Psychological Contract Breach and Workplace Deviance. *Journal of Applied Psychology, 93*(5), 1104–1117.
- Borman, W. C., Buck, D. E., Hanson, M. A., Motowidlo, S. J., Stark, S., & Drasgow, F. (2001). An examination of the comparative reliability, validity, and accuracy of performance ratings made using computerized adaptive rating scales. *Journal of Applied Psychology, 86*(5), 965.
- Borman, W. C., & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. In N. W. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 71–98). San Francisco: Jossey-Bass.
- Boucsein, W., & Thum, M. (1997). Design of work/rest schedules for computer work based on psychophysiological recovery measures. *International Journal of Industrial Ergonomics, 20*(1), 51–57.

- Bresin, K., & Gordon, K. H. (2013). Aggression as Affect Regulation: Extending Catharsis Theory to Evaluate Aggression and Experiential Anger in the Laboratory and Daily Life. *Journal of Social and Clinical Psychology, 32*(4), 400–423.
- Briner, R. B. (2000). Relationships between work environments, psychological environments and psychological well-being. *Occupational Medicine, 50*(5), 299–303.
- Briner, R. B., & Kiefer, T. (2005). Psychological Research into the Experience of Emotion at Work: Definitely Older, but Are We Any Wiser? *The Effect of Affect in Organizational Settings: Research on Emotion in Organizations, 1*, 289–315.
- Broadbent, D. E., Cooper, P. F., FitzGerald, P., & Parkes, K. R. (1982). The cognitive failures questionnaire (CFQ) and its correlates. *British Journal of Clinical Psychology, 21*(1), 1–16.
- Brockner, J., & Higgins, E. T. (2001). Regulatory focus theory: Implications for the study of emotions at work. *Organizational Behavior and Human Decision Processes, 86*(1), 35–66.
- Brown, L. A., & Roloff, M. E. (2011). Extra-Role Time, Burnout, and Commitment The Power of Promises Kept. *Business Communication Quarterly, 74*(4), 450–474.
- Browne, M. W., Cudeck, R., Bollen, K. A., & Long, J. S. (1993). Alternative ways of assessing model fit. *Sage Focus Editions, 154*, 136–136.
- Brownlie, N. (2012). *Trade Union Membership: 2011*. UK: Department for Business, Innovation and Skills, Crown Copyright.
- Bryk, A. S., & Raudenbush, S. W. (2002). *Hierarchical linear models: applications and data analysis methods*. (Second). London: Sage Publications, Inc.
- Burke, M. J., Sarpy, S. A., Tesluk, P. E., & Smith-Crowe, K. (2002). General safety performance: A test of a grounded theoretical model. *Personnel Psychology, 55*(2), 429–457.
- Burns, C. (2007). Measuring the impact of a psychological contract for health and safety. *People Management, 50*.
- Bushman, B. J. (2002). Does venting anger feed or extinguish the flame? Catharsis, rumination, distraction, anger, and aggressive responding. *Personality and Social Psychology Bulletin, 28*(6), 724–731.
- Bushman, B. J., Bonacci, A. M., Pedersen, W. C., Vasquez, E. A., & Miller, N. (2005). Chewing on it can chew you up: effects of rumination on triggered displaced aggression. *Journal of Personality and Social Psychology, 88*(6), 969.
- Byrne, B. M. (2004). Testing for multigroup invariance using AMOS graphics: A road less traveled. *Structural Equation Modeling, 11*(2), 272–300.
- Byrne, B. M. (2013). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. New York: Routledge.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*(2), 81.

- Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. E. (1993). A theory of performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 35–70). San Francisco: Jossey-Bass.
- Carlson, M., Wilcox, R., Chou, C.-P., Chang, M., Yang, F., Blanchard, J., ... Clark, F. (2011). Psychometric properties of reverse-scored items on the CES-D in a sample of ethnically diverse older adults. *Psychological Assessment, 23*(2), 558.
- Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: a control-process view. *Psychological Review, 97*(1), 19.
- Cassar, V., & Briner, R. B. (2011). The relationship between psychological contract breach and organizational commitment: Exchange imbalance as a moderator of the mediating role of violation. *Journal of Vocational Behavior, 78*(2), 283–289. <https://doi.org/doi:10.1016/j.jvb.2010.09.007>
- Centers for Disease Control and Prevention. (2001). Behavioral risk factor surveillance system survey questionnaire. *Atlanta, Georgia: US Department of Health and Human Services, Centers for Disease Control and Prevention, 22–23.*
- Chambel, M. J., & Alcover, C. M. (2011). The psychological contract of call-centre workers: Employment conditions, satisfaction and civic virtue behaviours. *Economic and Industrial Democracy, 32*(1), 115–134.
- Chambel, M. J., & Castanheira, F. (2012). Training opportunities and employee exhaustion in call centres: mediation by psychological contract fulfilment. *International Journal of Training and Development, 16*(2), 107–117.
- Chambel, M. J., & Oliveira-Cruz, F. (2010). Breach of psychological contract and the development of burnout and engagement: A longitudinal study among soldiers on a peacekeeping mission. *Military Psychology, 22*(2), 110–127.
- Chaudhry, A., Wayne, S. J., & Schalk, R. (2009). A Sensemaking Model of Employee Evaluation of Psychological Contract Fulfillment When and How Do Employees Respond to Change? *The Journal of Applied Behavioral Science, 45*(4), 498–520.
- Chen, C.-F., & Chen, S.-C. (2014). Investigating the effects of job demands and job resources on cabin crew safety behaviors. *Tourism Management, 41*(0), 45–52. <https://doi.org/10.1016/j.tourman.2013.08.009>
- Cheng, T., Mauno, S., & Lee, C. (2013). Do Job Control, Support, and Optimism Help Job Insecure Employees? A Three-Wave Study of Buffering Effects on Job Satisfaction, Vigor and Work-Family Enrichment. *Social Indicators Research, 118*(3), 1269–1291.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255.

- Cheyne, A., Cox, S., Oliver, A., & Tomás, J. M. (1998). Modelling safety climate in the prediction of levels of safety activity. *Work & Stress, 12*(3), 255–271.
- Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology, 94*(5), 1103–1127.
- Chuang, A., Judge, T. A., & Liaw, Y. J. (2012). Transformational leadership and customer service: A moderated mediation model of negative affectivity and emotion regulation. *European Journal of Work and Organizational Psychology, 21*(1), 28–56.
- Clarke, S. (2006a). Safety climate in an automobile manufacturing plant: The effects of work environment, job communication and safety attitudes on accidents and unsafe behaviour. *Personnel Review, 35*(4), 413–430.
- Clarke, S. (2006b). The relationship between safety climate and safety performance: A meta-analytic review. *Journal of Occupational Health Psychology, 11*(4), 315–327.
- Clarke, S. (2010). An integrative model of safety climate: Linking psychological climate and work attitudes to individual safety outcomes using meta-analysis. *Journal of Occupational and Organizational Psychology, 83*(3), 553–578.
- Clarke, S. (2012). The effect of challenge and hindrance stressors on safety behavior and safety outcomes: A meta-analysis. *Journal of Occupational Health Psychology, 17*(4), 387–397.
- Clarke, S. (2013). Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *Journal of Occupational and Organizational Psychology, 86*(1), 22–49.
- Clarke, S., & Robertson, I. (2008). An Examination of the Role of Personality in Work Accidents Using Meta-analysis. *Applied Psychology, 57*(1), 94–108.
- Clarke, S., & Robertson, I. T. (2005). A meta-analytic review of the Big Five personality factors and accident involvement in occupational and non-occupational settings. *Journal of Occupational & Organizational Psychology, 78*(3), 355–376. <https://doi.org/Article>
- Coffman, D. L., & MacCallum, R. C. (2005). Using parcels to convert path analysis models into latent variable models. *Multivariate Behavioral Research, 40*(2), 235–259.
- Cohen, J. D. (2005). The Vulcanization of the Human Brain: A Neural Perspective on Interactions between Cognition and Emotion. *The Journal of Economic Perspectives, 19*(4), 3–24.
- Colligan, M. J., & Cohen, A. (2004). The role of training in promoting workplace safety and health. In J. Barling & M. R. Frone (Eds.), *The Psychology of Workplace Safety* (pp. 223–248). Washington, DC: American Psychological Association.
- Conchie, S. M. (2013). Transformational leadership, intrinsic motivation, and trust: A moderated-mediated model of workplace safety. *Journal of Occupational Health Psychology, 18*(2), 198–210.

- Conchie, S. M., & Burns, C. (2009). Improving occupational safety: Using a trusted information source to communicate about risk. *Journal of Risk Research*, *12*(1), 13–25.
- Conchie, S. M., & Donald, I. J. (2009). The moderating role of safety-specific trust on the relation between safety-specific leadership and safety citizenship behaviors. *Journal of Occupational Health Psychology*, *14*(2), 137–147.
- Conchie, S. M., Taylor, P. J., & Donald, I. J. (2012). Promoting safety voice with safety-specific transformational leadership: The mediating role of two dimensions of trust. *Journal of Occupational Health Psychology*, *17*(1), 105.
- Conway, N., & Briner, R. B. (2002). A daily diary study of affective responses to psychological contract breach and exceeded promises. *Journal of Organizational Behavior*, *23*, 287–302.
- Conway, N., & Briner, R. B. (2005). *Understanding Psychological Contracts at Work: A Critical Evaluation of Theory and Research*. Oxford: Oxford University Press.
- Conway, N., & Briner, R. B. (2009). Fifty years of psychological contract research: What do we know and what are the main challenges. *International Review of Industrial and Organizational Psychology*, *24*(71), 71–131.
- Conway, N., & Coyle-Shapiro, J. A. M. (2012). The reciprocal relationship between psychological contract fulfilment and employee performance and the moderating role of perceived organizational support and tenure. *Journal of Occupational and Organizational Psychology*, *85*(2), 277–299.
- Conway, N., Guest, D., & Trenberth, L. (2011). Testing the differential effects of changes in psychological contract breach and fulfillment. *Journal of Vocational Behavior*, *79*(1), 267–276. <https://doi.org/10.1016/j.jvb.2011.01.003>
- Conway, N., Kiefer, T., Hartley, J., & Briner, R. B. (2014). Doing More with Less? Employee Reactions to Psychological Contract Breach via Target Similarity or Spillover during Public Sector Organizational Change. *British Journal of Management*, *25*(4), 737–754. <https://doi.org/10.1111/1467-8551.12041>
- Cooper, M. D., & Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research*, *35*(5), 497–512.
- Côté, S., Moskowitz, D., & Zuroff, D. C. (2012). Social relationships and intraindividual variability in interpersonal behavior: Correlates of interpersonal spin. *Journal of Personality and Social Psychology*, *102*(3), 646.
- Cox, S., Jones, B., & Rycraft, H. (2004). Behavioural approaches to safety management within UK reactor plants. *Safety Science*, *42*(9), 825–839.
- Coyle, I. R., Sleeman, S. D., & Adams, N. (1995). Safety climate. *Journal of Safety Research*, *26*(4), 247–254.

- Coyle-Shapiro, J. A. M., & Conway, N. (2005). Exchange Relationships: Examining Psychological Contracts and Perceived Organizational Support. *Journal of Applied Psychology, 90*(4), 774–781.
- Coyle-Shapiro, J. A. M., & Kessler, I. (2002). Exploring reciprocity through the lens of the psychological contract: Employee and employer perspectives. *European Journal of Work and Organizational Psychology, 11*(1), 69–86.
<https://doi.org/10.1080/13594320143000852>
- Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: a theoretical extension and meta-analytic test. *Journal of Applied Psychology, 95*(5), 834.
- Cropanzano, R., Anthony, E., Daniels, S., & Hall, A. (2016). SOCIAL EXCHANGE THEORY: A CRITICAL REVIEW WITH THEORETICAL REMEDIES. *Academy of Management Annals*.
<https://doi.org/10.5465/annals.2015.0099>
- Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal of Management, 31*(6), 874–900.
- Csikszentmihalyi, M., Larson, R., & Prescott, S. (1977). The ecology of adolescent activity and experience. *Journal of Youth and Adolescence, 6*(3), 281–294.
- Cullinane, N., & Dundon, T. (2006). The psychological contract: A critical review. *International Journal of Management Reviews, 8*(2), 113–129.
- Dalal, R. S. (2005). A meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior. *Journal of Applied Psychology, 90*(6), 1241.
- Dalal, R. S., Lam, H., Weiss, H. M., Welch, E., & Hulin, C. L. (2009). A dynamic approach to organizational citizenship behavior and counterproductive work behavior: Behavioral co-occurrence and switching, and dynamic relationships with mood and overall job performance. *Academy of Management Journal, 52*, 1051–1066.
- De Cuyper, N., & De Witte, H. (2006). The impact of job insecurity and contract type on attitudes, well-being and behavioural reports: A psychological contract perspective. *Journal of Occupational and Organizational Psychology, 79*(3), 395–409.
<https://doi.org/10.1348/096317905X53660>
- De Cuyper, N., Van der Heijden, B. I. J. M., & De Witte, H. (2011). Associations between perceived employability, employee well-being, and its contribution to organizational success: a matter of psychological contracts? *The International Journal of Human Resource Management, 22*(7), 1486–1503. <https://doi.org/10.1080/09585192.2011.561962>

- De Lange, A. H., Taris, T. W., Kompier, M. A., Houtman, I. L., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress, 18*(2), 149–166.
- De Vos, A., Buyens, D., & Schalk, R. (2003). Psychological contract development during organizational socialization: adaptation to reality and the role of reciprocity. *Journal of Organizational Behavior, 24*(5), 537–559.
- Deblois, L. (1926). *Industrial Safety Organisation for Executives and Safety Engineer*. New York: McGraw-Hill Book Company.
- Deblois, L. (1927). Has the industrial accident rate declined since 1913? In *Proceedings of the Casualty Actuarial Society* (Vol. XIV, pp. 84–96). Arlington, Virginia.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deffenbacher, J. L., Oetting, E. R., Huff, M. E., Cornell, G. R., & Dallager, C. J. (1996). Evaluation of two cognitive-behavioral approaches to general anger reduction. *Cognitive Therapy and Research, 20*(6), 551–573.
- Dekker, S. W. A. (2002). Reconstructing human contributions to accidents: the new view on error and performance. *Journal of Safety Research, 33*(3), 371–385.
[https://doi.org/10.1016/S0022-4375\(02\)00032-4](https://doi.org/10.1016/S0022-4375(02)00032-4)
- Deligkaris, P., Panagopoulou, E., Montgomery, A. J., & Masoura, E. (2014). Job burnout and cognitive functioning: A systematic review. *Work & Stress, 28*(2), 107–123.
- DeLongis, A., Hemphill, K. J., & Lehman, D. R. (1992). A Structured Diary Methodology for the Study of Daily Events. In F. B. Bryant, J. Edwards, R. S. Tindale, E. J. Posavac, L. Heath, E. Henderson, & Y. Suarez-Balcazar (Eds.), *Methodological Issues in Applied Social Psychology* (pp. 83–109). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4899-2308-0_5
- Demerouti, E., Bakker, A. B., De Jonge, J., Janssen, P. P., & Schaufeli, W. B. (2001). Burnout and engagement at work as a function of demands and control. *Scandinavian Journal of Work, Environment & Health, 27*9–286.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499.
- Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the Royal Statistical Society. Series B (Methodological), 1*–38.
- DePasquale, J. P., & Geller, E. S. (2000). Critical success factors for behavior-based safety: A study of twenty industry-wide applications. *Journal of Safety Research, 30*(4), 237–249.

- Didla, S., Mearns, K., & Flin, R. (2009). Safety citizenship behaviour: A proactive approach to risk management. *Journal of Risk Research*, *12*(3–4), 475–483.
- Diefendorff, J. M., Richard, E. M., & Yang, J. (2008). Linking emotion regulation strategies to affective events and negative emotions at work. *Journal of Vocational Behavior*, *73*(3), 498–508. <https://doi.org/10.1016/j.jvb.2008.09.006>
- Duffy, M. K., Ganster, D. C., & Pagon, M. (2002). Social undermining in the workplace. *Academy of Management Journal*, *45*(2), 331–351.
- Dulac, T., Coyle-Shapiro, J. A. M., Henderson, D. J., & Wayne, S. J. (2008). Not all responses to breach are the same: the interconnection of social exchange and psychological contract processes in organizations. *Academy of Management Journal*, *51*(6), 1079–1098.
- Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods*, *4*(3), 265–287.
- Eid, M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personality correlates. *Journal of Personality and Social Psychology*, *76*(4), 662.
- Endler, N. S., & Magnusson, D. (1976). Toward an interactional psychology of personality. *Psychological Bulletin*, *83*(5), 956–974.
- Equasis. (2015). *The world fleet 2014: Equasis statistics*. Retrieved from <http://www.emsa.europa.eu/implementation-tasks/equasis-a-statistics/download/3640/472/23.html>
- Eurostat. (2012). *Eurostat Regional Yearbook*. Luxembourg: European Commission.
- Eysenck, M. W., & Calvo, M. G. (1992). Anxiety and performance: The processing efficiency theory. *Cognition & Emotion*, *6*(6), 409–434.
- Farmer, E. (1925). *The Method of Grouping by Differential Tests in Relation to Accident Proneness*. (The Industrial Fatigue Board, Annual Report) (pp. 43–45).
- Farnsworth, E. (1982). *Contracts*. Boston: Little, Brown.
- Finkel, S. E. (1995). *Causal analysis with panel data*. London: Sage.
- Fischer, P., Kastenmüller, A., & Asal, K. (2012). Ego depletion increases risk-taking. *The Journal of Social Psychology*, *152*(5), 623–638.
- Flanagan, J. C. (1956). The evaluation of methods in applied psychology and the problem of criteria. *Occupational Psychology*, *30*, 1–9.
- Flin, R., Mearns, K., O'Connor, P., & Bryden, R. (2000). Measuring safety climate: identifying the common features. *Safety Science*, *34*(1–3), 177–192.
- Forgas, J. P., & George, J. M. (2001). Affective influences on judgments and behavior in organizations: An information processing perspective. *Organizational Behavior and Human Decision Processes*, *86*(1), 3–34.

- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 39–50.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218.
- Fredrickson, B. L. (2004). The broaden-and-build theory of positive emotions. *Philosophical Transactions-Royal Society of London Series B Biological Sciences*, 1367–1378.
- French, J. R., Caplan, R. D., & Van Harrison, R. (1982). *The mechanisms of job stress and strain* (Vol. 8). New York: Wiley.
- Froggatt, P., & Smiley, J. A. (1964). The concept of accident proneness: a review. *British Medical Journal*, 21(1), 1.
- Fugate, M., Prussia, G. E., & Kinicki, A. J. (2012). Managing Employee Withdrawal During Organizational Change. *Journal of Management*, 38(3), 890–914.
<https://doi.org/10.1177/0149206309352881>
- Gaertner, K. N., & Nollen, S. D. (1989). Career experiences, perceptions of employment practices, and psychological commitment to the organization. *Human Relations*, 42(11), 975–991.
- Gakovic, A., & Tetrick, L. E. (2003). Psychological Contract Breach as a Source of Strain for Employees. *Journal of Business and Psychology*, 18(2), 235–246.
- Garrick, A., Mak, A. S., Cathcart, S., Winwood, P. C., Bakker, A. B., & Lushington, K. (2014). Psychosocial safety climate moderating the effects of daily job demands and recovery on fatigue and work engagement. *Journal of Occupational and Organizational Psychology*, 87(4), 694–714.
- Gaskin, J. (2012). SEM. Retrieved 3 July 2015, from http://statwiki.kolobkcreations.com/wiki/Main_Page
- Gendolla, G. H., & Richter, M. (2010). Effort mobilization when the self is involved: Some lessons from the cardiovascular system. *Review of General Psychology*, 14(3), 212.
- Genet, J. J., & Siemer, M. (2012). Rumination Moderates the Effects of Daily Events on Negative Mood: Results From a Diary Study. *Emotion*, 12(6), 1329–1339.
- George, J. M., & Brief, A. P. (1992). Feeling good-doing good: a conceptual analysis of the mood at work-organizational spontaneity relationship. *Psychological Bulletin*, 112(2), 310.
- Ghosh, V. E., & Gilboa, A. (2014). What is a memory schema? A historical perspective on current neuroscience literature. *Neuropsychologia*, 53, 104–114.
- Gignac, G. E. (2009). Partial Confirmatory Factor Analysis: Described and Illustrated on the NEO-PI-R. *Journal of Personality Assessment*, 91(1), 40–47.
- Glass, D. C., & Singer, J. E. (1972). Behavioral Aftereffects of Unpredictable and Uncontrollable Aversive Events: Although subjects were able to adapt to loud noise and other stressors

- in laboratory experiments, they clearly demonstrated adverse aftereffects. *American Scientist*, 60(4), 457–465.
- Glazner, J. E., Borgerding, J., Lowery, J. T., Bondy, J., Mueller, K. L., & Kreiss, K. (1998). Construction injury rates may exceed national estimates: evidence from the construction of Denver International Airport. *American Journal of Industrial Medicine*, 34(2), 105–112.
- Gleason, M., Bolger, N., & Shrout, P. (2001). The effects of research design on reports of mood: comparing daily diary, panel, and cross-sectional designs. Presented at the Society for Personality and Social Psychology Conference, San Antonio, Texas.
- Glendon, A. I., & Litherland, D. K. (2001). Safety climate factors, group differences and safety behaviour in road construction. *Safety Science*, 39(3), 157–188.
- Glomb, T. M., Bhave, D. P., Miner, A. G., & Wall, M. (2011). Doing good, feeling good: Examining the role of organizational citizenship behaviors in changing mood. *Personnel Psychology*, 64(1), 191–223.
- Goldberg, L. S., & Grandey, A. A. (2007). Display rules versus display autonomy: emotion regulation, emotional exhaustion, and task performance in a call center simulation. *Journal of Occupational Health Psychology*, 12(3), 301.
- Gouldner, A. W. (1960). The Norm of Reciprocity: A Preliminary Statement. *American Sociological Review*, 25(2), 161–178.
- Grandey, A. A. (2000). Emotional regulation in the workplace: A new way to conceptualize emotional labor. *Journal of Occupational Health Psychology*, 5(1), 95.
- Grandey, A. A. (2003). When ‘The Show Must Go on’: Surface Acting and Deep Acting as Determinants of Emotional Exhaustion and Peer-Rated Service Delivery. *The Academy of Management Journal*, 46(1), 86–96.
- Green, F. (2004). Why Has Work Effort Become More Intense? *Industrial Relations*, 43(4), 709–741.
- Greenhalgh, L., & Rosenblatt, Z. (1984). Job insecurity: Toward conceptual clarity. *Academy of Management Review*, 9(3), 438–448.
- Greenwood, M., & Wood, H. (1919). The Incidence of Industrial Accidents upon Individuals with Special Reference to Multiple Accidents. In W. J. Haddon, E. A. Suchman, & D. A. Klein (Eds.), *Accident Research* (pp. 389–396). New York: Harper & Row.
- Griep, Y., Vantilborgh, T., Baillien, E., & Pepermans, R. (2015). The mitigating role of leader–member exchange when perceiving psychological contract violation: a diary survey study among volunteers. *European Journal of Work and Organizational Psychology*, 25(2), 254–271.

- Griffin, M. A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health Psychology, 5*(3), 347–358.
- Griffin, M. A., Neal, A., & Neale, M. (2000). The contribution of task performance and contextual performance to effectiveness: Investigating the role of situational constraints. *Applied Psychology, 49*(3), 517–533.
- Griffin, M. A., & Talati, Z. (2011). Meta-analysis of active management-by-exception variability across leadership contexts. Presented at the Academy of Management annual conference, San Antonio, TX.
- Grindle, A. C., Dickinson, A. M., & Boettcher, W. (2000). Behavioral safety research in manufacturing settings: A review of the literature. *Journal of Organizational Behavior Management, 20*(1), 29–68.
- Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*(1), 224–237.
- Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299.
- Gross, J. J., & John, O. P. (1998). Mapping the domain of expressivity: multimethod evidence for a hierarchical model. *Journal of Personality and Social Psychology, 74*(1), 170.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. *Handbook of Emotion Regulation, 3*, 24.
- Gruys, M. L., & Sackett, P. R. (2003). Investigating the dimensionality of counterproductive work behavior. *International Journal of Selection and Assessment, 11*(1), 30–42.
- Guerrero, S., & Herrbach, O. (2008). The affective underpinnings of psychological contract fulfilment. *Journal of Managerial Psychology, 23*(1), 4–17.
- Guest, D. (1998). Is the psychological contract worth taking seriously? *Journal of Organizational Behavior, 19*, 649–664.
- Guion, R. M. (1973). A note on organizational climate. *Organizational Behavior and Human Performance, 9*(1), 120–125.
- Guldenmund, F. W. (2000). The nature of safety culture: a review of theory and research. *Safety Science, 34*(1–3), 215–257.
- Guldenmund, F. W. (2010). (Mis)understanding Safety Culture and Its Relationship to Safety Management. *Risk Analysis: An International Journal, 30*(10), 1466–1480.

- Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology, 60*(2), 159.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16*(2), 250–279.
- Hagedoorn, M., Van Yperen, N. W., Van de Vliert, E., & Buunk, B. P. (1999). Employees' reactions to problematic events: A circumplex structure of five categories of responses, and the role of job satisfaction. *Journal of Organizational Behavior, 20*(3), 309–321.
- Hagger, M. S., Wood, C., Stiff, C., & Chatzisarantis, N. L. D. (2010). Ego Depletion and the Strength Model of Self-Control: A Meta-Analysis. *Psychological Bulletin, 136*(4), 495–525.
<https://doi.org/Article>
- Halbesleben, J. R. B. (2010). The role of exhaustion and workarounds in predicting occupational injuries: a cross-lagged panel study of health care professionals. *Journal of Occupational Health Psychology, 15*(1), 1.
- Hansen, H., Nielsen, D., & Frydenberg, M. (2002). Occupational accidents aboard merchant ships. *Occupational and Environmental Medicine, 59*(2), 85–91.
- Hansez, I., & Chmiel, N. (2010). Safety behavior: Job demands, job resources, and perceived management commitment to safety. *Journal of Occupational Health Psychology, 15*(3), 267–278.
- Harano, R. M., & Hubert, D. E. (1974). *An evaluation of California's 'good driver' incentive program*. US: Transportation Research Board.
- Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology, 87*(2), 268–279.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology, 67*(3), 451–470.
- Heggstad, E. D., & Kanfer, R. (2000). Individual differences in trait motivation: development of the Motivational Trait Questionnaire. *International Journal of Educational Research, 33*(7–8), 751–776. [https://doi.org/10.1016/S0883-0355\(00\)00049-5](https://doi.org/10.1016/S0883-0355(00)00049-5)
- Heinrich, H. (1931). *Industrial Accident Prevention a Scientific Approach* (First). London: McGraw-Hill.
- Hekman, D. R., Bigley, G. A., Steensma, H. K., & Hereford, J. F. (2009). Combined effects of organizational and professional identification on the reciprocity dynamic for professional employees. *Academy of Management Journal, 52*(3), 506–526.

- Henderson, D. J., Wayne, S. J., Shore, L. M., Bommer, W. H., & Tetrick, L. E. (2008). Leader--member exchange, differentiation, and psychological contract fulfillment: a multilevel examination. *Journal of Applied Psychology, 93*(6), 1208.
- Herriot, P., Manning, W. E. G., & Kidd, J. M. (1997). The Content of the Psychological Contract. *British Journal of Management, 8*(2), 151–162. <https://doi.org/10.1111/1467-8551.0047>
- Hetherington, C., Flin, R., & Mearns, K. (2006). Safety in shipping: The human element. *Journal of Safety Research, 37*(4), 401–411.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist, 52*(12), 1280.
- Higgins, E. T. (2000). Making a good decision: value from fit. *American Psychologist, 55*(11), 1217.
- Hoaglin, D. C., & Iglewicz, B. (1987). Fine-tuning some resistant rules for outlier labeling. *Journal of the American Statistical Association, 82*(400), 1147–1149.
- Hoaglin, D. C., Iglewicz, B., & Tukey, J. W. (1986). Performance of some resistant rules for outlier labeling. *Journal of the American Statistical Association, 81*(396), 991–999.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44*(3), 513.
- Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: advancing conservation of resources theory. *Applied Psychology, 50*(3), 337–421.
- Hockey, G. R. J. (1993). Cognitive-energetical control mechanisms in the management of work demands and psychological health. In A. Baddely & L. Weiskrantz (Eds.), *Attention: Selection, awareness, and control* (pp. 328–345). Oxford, England: Clarendon Press.
- Hockey, G. R. J., Maule, A. J., Clough, P. J., & Bdzola, L. (2000). Effects of negative mood states on risk in everyday decision making. *Cognition & Emotion, 14*(6), 823–855.
- Hofmann, D. A., & Morgeson, F. P. (1999). Safety-related behavior as a social exchange: The role of perceived organizational support and leader–member exchange. *Journal of Applied Psychology, 84*(2), 286–296.
- Hofmann, D. A., Morgeson, F. P., & Gerras, S. J. (2003). Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: Safety climate as an exemplar. *Journal of Applied Psychology, 88*(1), 170–178.
- Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology, 49*(2), 307–339. <https://doi.org/Article>
- Holding, D. H., Loeb, M., & Baker, M. A. (1983). Effects and aftereffects of continuous noise and computation work on risk and effort choices. *Motivation and Emotion, 7*(4), 331–344.

- Holloway, W. (1991). *Work psychology and organizational behaviour*. London: SAGE Publications.
- Hoyle, R. (2011). *Modeling Longitudinal Data Using Structural Equation Methods*. Webcast presented at the Centre for Advanced Research Methods (CARMA).
- HSE. (2013). Health and Safety Executive Annual Statistics Report 2012/13 - hssh1213.pdf. Retrieved 3 June 2014, from <http://www.hse.gov.uk/statistics/overall/hssh1213.pdf>
- Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, 3(4), 424.
- Hui, C., Lee, C., & Rousseau, D. M. (2004). Psychological contract and organizational citizenship behavior in China: investigating generalizability and instrumentality. *Journal of Applied Psychology*, 89(2), 311.
- Hulin, C. L. (1963). Relevance and equivalence in criterion measures of executive success. *Journal of Industrial Psychology*, 1, 67–78.
- Iaffaldano, M. T., & Muchinsky, P. M. (1985). Job satisfaction and job performance: A meta-analysis. *Psychological Bulletin*, 97(2), 251.
- Iida, M., Shrout, P. E., Laurenceau, J.-P., Bolger, N., & Cooper, H. (2012). Using diary methods in psychological research. In P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology* (Vol. Vol 1: Foundations, planning, measures, and psychometrics, pp. 277–305). Washington, DC: American Psychological Association.
- Ilies, R., Fulmer, I. S., Spitzmuller, M., & Johnson, M. D. (2009). Personality and citizenship behavior: the mediating role of job satisfaction. *Journal of Applied Psychology*, 94(4), 945.
- ILO. (2004, April 28). 28 April, World Day for Safety and Health at Work - Two million work deaths a year: A preventable tragedy. Retrieved from http://www.ilo.org/global/about-the-ilo/newsroom/features/WCMS_075605/lang--en/index.htm
- Ingrams, K. (2007). Prosocial Reactions to Psychological Contract Violation: An Interdependence Theory Perspective. Presented at the Workshop on Research Advances in Organizational Behavior, France: University of Toulouse.
- International Chamber of Shipping. (2015). Number and Nationality of World's Seafarers. Retrieved from <http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade/number-and-nationality-of-world's-seafarers>
- Jamil, A., Raja, U., & Darr, W. (2013). Psychological Contract Types as Moderator in the Breach-Violation and Violation-Burnout Relationships. *The Journal of Psychology*, 147(5), 491–515.

- Janssen, O., Lam, C. K., & Huang, X. (2010). Emotional exhaustion and job performance: The moderating roles of distributive justice and positive affect. *Journal of Organizational Behavior, 31*(6), 787–809.
- Janssens, M., Brett, J. M., & Smith, F. J. (1995). Confirmatory cross-cultural research: Testing the viability of a corporation-wide safety policy. *Academy of Management Journal, 38*(2), 364–382.
- Jensen, J. M., Opland, R. A., & Ryan, A. M. (2010). Psychological contracts and counterproductive work behaviors: Employee responses to transactional and relational breach. *Journal of Business and Psychology, 25*(4), 555–568.
- Johnson, J. L., & O'Leary-Kelly, A. M. (2003). The effects of psychological contract breach and organizational cynicism: not all social exchange violations are created equal. *Journal of Organizational Behavior, 24*(5), 627–647. <https://doi.org/10.1002/job.207>
- Jonah, B. A., Thiessen, R., & Au-Yeung, E. (2001). Sensation seeking, risky driving and behavioral adaptation. *Accident Analysis & Prevention, 33*(5), 679–684.
- Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: a meta-analytic review. *Journal of Applied Psychology, 87*(4), 797.
- Judge, T. A., Rodell, J. B., Klinger, R. L., Simon, L. S., & Crawford, E. R. (2013). Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives. *Journal of Applied Psychology, 98*(6), 875–925.
- Judge, T. A., Simon, L. S., Hurst, C., & Kelley, K. (2013). What I experienced yesterday is who I am today: Relationship of work motivations and behaviors to within-individual variation in the five-factor model of personality. *Journal of Applied Psychology, 99*(2), 199–221.
- Kain, J., & Jex, S. (2010). Karasek's (1979) job demands-control model: A summary of current issues and recommendations for future research. *Research in Occupational Stress and Well-Being, 8*, 237–268.
- Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology, 74*(4), 657.
- Kanfer, R., Ackerman, P. L., & Heggestad, E. D. (1996). Motivational skills & self-regulation for learning: A trait perspective. *Learning and Individual Differences, 8*(3), 185–209.
- Kanfer, R., & Heggestad, E. D. (1999). Individual differences in motivation: Traits and self-regulatory skills. In P. L. Ackerman, P. C. Kyllonen, & R. D. Roberts (Eds.), *Learning and individual differences: Process, trait, and content determinants* (pp. 293–313). Washington, DC: American Psychological Association.

- Kanouse, D. E., & Hanson, L. R. jr. (1971). Negativity in evaluations. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valins, & B. Weiner (Eds.), *Attribution: perceiving the cause of behavior* (pp. 47–62). Morristown: General Learning Press.
- Kaplan, S., & Tetrick, L. E. (2011). Workplace safety and accidents: An industrial and organizational psychology perspective. In *APA handbook of industrial and organizational psychology, Vol 1: Building and developing the organization*. (pp. 455–472). Washington, DC US: American Psychological Association. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2009-22818-014&site=ehost-live>
- Karasek, R. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*(2), 285–308.
- Karasek, R., & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. New York: Basic Books.
- Kasl, S. V. (1996). The influence of the work environment on cardiovascular health: a historical, conceptual, and methodological perspective. *Journal of Occupational Health Psychology*, *1*(1), 42.
- Kiazad, K., Seibert, S. E., & Kraimer, M. L. (2014). Psychological contract breach and employee innovation: A conservation of resources perspective. *Journal of Occupational and Organizational Psychology*, *87*(3), 535–556.
- Kickul, J., Lester, S. W., & Finkl, J. (2002). Promise breaking during radical organizational change: do justice interventions make a difference? *Journal of Organizational Behavior*, *23*(4), 469–488. <https://doi.org/10.1002/job.151>
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. NY: Guilford Publicaton.
- Koelega, H. S. (1992). Extraversion and vigilance performance: 30 years of inconsistencies. *Psychological Bulletin*, *112*(2), 239.
- Kornhauser, A. (1965). *Mental health of the industrial worker: A Detroit study*. Oxford, England: Wiley.
- Kotter, J. P. (1973). The Psychological Contract: Managing the Joining-Up Process. *California Management Review*, *15*(3).
- Krause, T. R., Hidley, J. H., & Hodson, S. J. (1997). *The behavior-based safety process: Managing involvement for an injury-free culture*. New York: Van Nostrand Reinhold Company.
- Krause, T. R., Seymour, K. J., & Sloat, K. C. M. (1999). Long-term evaluation of a behavior-based method for improving safety performance: a meta-analysis of 73 interrupted time-series replications. *Safety Science*, *32*(1), 1–18.
- Kreft, I., & de Leeuw, J. (1998). *Introducing multilevel modeling*. London: Sage.

- Krull, J. L., & MacKinnon, D. P. (2001). Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research, 36*(2), 249–277.
- Lambert, L. S., Edwards, J. R., & Cable, D. M. (2003). Breach and Fulfillment of the Psychological Contract: A Comparison of Traditional and Expanded Views. *Personnel Psychology, 56*, 895–934.
- Landis, R. S., Beal, D. J., & Tesluk, P. E. (2000). A comparison of approaches to forming composite measures in structural equation models. *Organizational Research Methods, 3*(2), 186–207.
- Larson, R. W., & Almeida, D. M. (1999). Emotional transmission in the daily lives of families: A new paradigm for studying family process. *Journal of Marriage and the Family, 61*(1), 5–20.
- Lawshe, C. H. J. (1948). *Principles of personnel testing*. New York: McGraw-Hill.
- Lazarus, R., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.
- Lefkowitz, R. Y., Slade, M. D., & Redlich, C. A. (2015). Injury, illness, and work restriction in merchant seafarers. *American Journal of Industrial Medicine, 58*(6), 688–696.
- Legault, L., & Inzlicht, M. (2013). Self-determination, self-regulation, and the brain: Autonomy improves performance by enhancing neuroaffective responsiveness to self-regulation failure. *Journal of Personality and Social Psychology, 105*(1), 123.
- Leigh, J. P., Marcin, J. P., & Miller, T. R. (2004). An estimate of the US government's undercount of nonfatal occupational injuries. *Journal of Occupational and Environmental Medicine, 46*(1), 10–18.
- LePine, J. A., Erez, A., & Johnson, D. E. (2002). The nature and dimensionality of organizational citizenship behavior: a critical review and meta-analysis. *Journal of Applied Psychology, 87*(1), 52.
- Lester, S. W., & Kickul, J. (2001). Psychological Contracts in the 21st Century: What Employees Value Most and How Well Organizations Are Responding to These Expectations. *Human Resource Planning, 24*(1), 10–21. <https://doi.org/Article>
- Levinson, H., Price, C. R., Munden, K. J., Mandl, H. J., & Solley, C. M. (1962). *Men, Management, and Mental Health*. Cambridge, MA: Harvard University Press.
- Li, N., Barrick, M. R., Zimmerman, R. D., & Chiaburu, D. S. (2014). Retaining the Productive Employee: The Role of Personality. *The Academy of Management Annals, 8*(1), 347–395. <https://doi.org/10.1080/19416520.2014.890368>
- Lindebaum, D. (2016). Critical Essay: Building new management theories on sound data? The case of neuroscience. *Human Relations, 69*(3), 537–550.

- Lindebaum, D., & Jordan, P. J. (2014). A critique on neuroscientific methodologies in organizational behavior and management studies. *Journal of Organizational Behavior*, 35(7), 898–908.
- Litt, M. D., Cooney, N. L., & Morse, P. (1998). Ecological momentary assessment (EMA) with treated alcoholics: methodological problems and potential solutions. *Health Psychology*, 17(1), 48.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705.
- Luchman, J. N., & González-Morales, M. G. (2013). Demands, control, and support: a meta-analytic review of work characteristics interrelationships. *Journal of Occupational Health Psychology*, 18(1), 37.
- Luria, G. (2008). Climate strength—How leaders form consensus. *The Leadership Quarterly*, 19(1), 42–53.
- Lusk, S. L., Ronis, D. L., & Baer, L. M. (1995). A comparison of multiple indicators observations, supervisor report, and self-report as measures of workers' hearing protection use. *Evaluation & the Health Professions*, 18(1), 51–63.
- Maas, C. J., & Hox, J. J. (2004). Robustness issues in multilevel regression analysis. *Statistica Neerlandica*, 58(2), 127–137.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7(1), 83.
- Macneil, I. R. (1985). Relational contract: What we do and do not know. *Wisconsin Law Review*, 483–525.
- March, J. G., & Simon, H. A. (1958). *Organizations*. Oxford, England: Wiley.
- Marler, J. H., Woodard Barringer, M., & Milkovich, G. T. (2002). Boundaryless and traditional contingent employees: worlds apart. *Journal of Organizational Behavior*, 23(4), 425–453. <https://doi.org/10.1002/job.148>
- Martin, M. (1983). Cognitive failure: Everyday and laboratory performance. *Bulletin of the Psychonomic Society*, 21(2), 97–100.
- Martínez-Córcoles, M., Gracia, F. J., Tomás, I., Peiró, J. M., & Schöbel, M. (2013). Empowering team leadership and safety performance in nuclear power plants: A multilevel approach. *Safety Science*, 51(1), 293–301. <https://doi.org/10.1016/j.ssci.2012.08.001>
- Martinko, M., Gundlach, M., & Douglas, S. (2002). Toward an Integrative Theory of Counterproductive Workplace Behavior: A Causal Reasoning Perspective. *International Journal of Selection and Assessment*, 10(1&2), 36–50.
- Mason, S. (1997). *Procedural violations-causes, costs and cures*. Oxford: Butterworth Heinemann.

- McInnis, K. J., Meyer, J. P., & Feldman, S. (2009). Psychological contracts and their implications for commitment: A feature-based approach. *Journal of Vocational Behavior, 74*(2), 165–180.
- Mearns, K., Flin, R., Gordon, R., & Fleming, M. (2001). Human and organizational factors in offshore safety. *Work & Stress, 15*(2), 144–160.
- Mearns, K., & Reader, T. (2008). Organizational support and safety outcomes: An uninvestigated relationship? *Safety Science, 46*(3), 388–397.
- Meckler, M., Drake, B. H., & Levinson, H. (2003). Putting psychology back into psychological contracts. *Journal of Management Inquiry, 12*(3), 217–228.
- Meyer, R. D., Dalal, R. S., & Hermida, R. (2010). A review and synthesis of situational strength in the organizational sciences. *Journal of Management, 36*(1), 121–140.
- Miner, A. G., & Glomb, T. M. (2010). State mood, task performance, and behavior at work: A within-persons approach. *Organizational Behavior and Human Decision Processes, 112*(1), 43–57.
- Miner, A. G., Glomb, T. M., & Hulin, C. (2005). Experience sampling mood and its correlates at work. *Journal of Occupational and Organizational Psychology, 78*(2), 171–193.
<https://doi.org/10.1348/096317905X40105>
- Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review, 80*(4), 252.
- Mischel, W. (1977). On the future of personality measurement. *American Psychologist, 32*(4), 246.
- Montes, S. D., & Irving, P. G. (2008). Disentangling the Effects of Promised and Delivered Inducements: Relational and Transactional Contract Elements and the Mediating Role of Trust. *Journal of Applied Psychology, 93*(6), 1367–1381.
- Montes, S. D., & Zweig, D. (2009). Do promises matter? An exploration of the role of promises in psychological contract breach. *Journal of Applied Psychology, 94*(5), 1243–1260.
- Morrison, E. W., & Robinson, S. L. (1997). When Employees Feel Betrayed: A Model of How Psychological Contract Violation Develops. *Academy of Management Review, 22*(1), 226–256.
- Moskal, B. (1992). Managing survivors. *Industry Week, 3*, 15–22.
- Motowidlo, S. J. (2003). Job Performance. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Handbook of Psychology* (Vol. 12, pp. 39–53). Hoboken, NJ: John Wiley & Sons, Inc.
- Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology, 89*(6), 852.
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247–259.

- Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as a limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*(3), 774.
- Murray, J. E. (1974). *Contracts*. New York: Bobbs-Merrill.
- Nahrgang, J. D., Morgeson, F. P., & Hofmann, D. A. (2011). Safety at Work: A Meta-Analytic Investigation of the Link Between Job Demands, Job Resources, Burnout, Engagement, and Safety Outcomes. *Journal of Applied Psychology, 96*(1), 71–94.
<https://doi.org/Article>
- Naylor, J. C., Pritchard, R. D., & Ilgen, D. R. (1980). *A theory of behavior in organizations*. New York: Academic Press.
- Neal, A., & Griffin, M. A. (2004). Safety climate and safety at work. In J. Barling & M. R. Frone (Eds.), *The Psychology of Workplace Safety* (pp. 15–34). Washington, DC: American Psychological Association.
- Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology, 91*(4), 946–953.
- Neal, A., Griffin, M. A., & Hart, P. M. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science, 34*(1–3), 99–109.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*(1), 115–121.
- Norman, D. A. (1981). Categorization of action slips. *Psychological Review, 88*(1), 1.
- Nunnally, J. C. (1967). *Psychometric theory* (Vol. 226). New York: McGraw-Hill.
- Oatley, K. (1992). *Best laid schemes: The psychology of the emotions*. Paris: Cambridge University Press.
- O'Connor, P., Campbell, J., Newon, J., Melton, J., Salas, E., & Wilson, K. A. (2008). Crew resource management training effectiveness: a meta-analysis and some critical needs. *The International Journal of Aviation Psychology, 18*(4), 353–368.
- O'Dea, A., & Flin, R. (2001). Site managers and safety leadership in the offshore oil and gas industry. *Safety Science, 37*(1), 39–57.
- O'Driscoll, M. P., Cooper-Thomas, H. D., Bentley, T., Catley, B. E., Gardner, D. H., & Trenberth, L. (2011). Workplace bullying in New Zealand: A survey of employee perceptions and attitudes. *Asia Pacific Journal of Human Resources, 49*(4), 390–408.
- Ohly, S., & Schmitt, A. (2013). What Makes Us Enthusiastic, Angry, Feeling at Rest or Worried? Development and Validation of an Affective Work Events Taxonomy Using Concept Mapping Methodology. *Journal of Business and Psychology, 1*–21.

- Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research. *Journal of Personnel Psychology, 9*(2), 79–93.
- Olafsen, A. H., Niemiec, C. P., Halvari, H., Deci, E. L., & Williams, G. C. (2016). On the dark side of work: a longitudinal analysis using self-determination theory. *European Journal of Work and Organizational Psychology, 1*–11.
- O’Neill, O. A., Vandenberg, R. J., DeJoy, D. M., & Wilson, M. G. (2009). Exploring relationships among anger, perceived organizational support, and workplace outcomes. *Journal of Occupational Health Psychology, 14*(3), 318–333.
- Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA, England: Lexington Books/D. C. Heath and Com. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=1988-97376-000&site=ehost-live>
- Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology, 48*(4), 775–802.
- Pagell, M., Johnston, D., Veltri, A., Klassen, R., & Biehl, M. (2013). Is Safe Production an Oxymoron? *Production and Operations Management, 23*(7), 1161–1175.
- Parker, S. K., Axtell, C. M., & Turner, N. (2001). Designing a safer workplace: Importance of job autonomy, communication quality, and supportive supervisors. *Journal of Occupational Health Psychology, 6*(3), 211.
- Parker, S. K., & Turner, N. (2002). Work design and individual work performance: Research findings and an agenda for future inquiry. In S. Sonnentag (Ed.), *Psychological Management of Individual Performance* (pp. 69–93). Chichester: Wiley.
- Parks, J. M., & Kidder, D. L. (1994). Till death us do part... Changing work relationships in the 1990s. *Trends in Organizational Behavior, 1*, 111–136.
- Parks, J. M., & Schmedemann, D. A. (1994). When promises become contracts: Implied contracts and handbook provisions on job security. *Human Resource Management, 33*(3), 403–423.
- Parzefall, M.-R., & Hakanen, J. (2010). Psychological contract and its motivational and health-enhancing properties. *Journal of Managerial Psychology, 25*(1), 4–21.
- Pearlin, L. I. (1962). Alienation from work: A study of nursing personnel. *American Sociological Review, 27*(3), 314–326.
- Peeters, G., & Czapinski, J. (1990). Positive-negative asymmetry in evaluations: The distinction between affective and informational negativity effects. *European Review of Social Psychology, 1*(1), 33–60.
- Perrow, C. (1984). *Normal Accidents: Living with High-Risk Technologies*. New York: Basic Books.

- Pitariu, A. H., & Ployhart, R. E. (2010). Explaining change: Theorizing and testing dynamic mediated longitudinal relationships. *Journal of Management, 36*(2), 405–429.
- Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal Research: The Theory, Design, and Analysis of Change. *Journal of Management, 36*(1), 94–120.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly, 1*(2), 107–142.
[https://doi.org/10.1016/1048-9843\(90\)90009-7](https://doi.org/10.1016/1048-9843(90)90009-7)
- Podsakoff, P. M., MacKenzie, S. B., Paine, J. B., & Bachrach, D. G. (2000). Organizational Citizenship Behaviors: A Critical Review of the Theoretical and Empirical Literature and Suggestions for Future Research. *Journal of Management, 26*(3), 513–563.
- Pousette, A., Larsson, S., & Törner, M. (2008). Safety climate cross-validation, strength and prediction of safety behaviour. *Regulatory Issues, Safety Climate, Culture and Management Papers Selected from the Third International Conference Working on Safety (WOS2006), September 12-15th, 2006, Zeewolde, The Netherland, 46*(3), 398–404.
<https://doi.org/10.1016/j.ssci.2007.06.016>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*(1), 185–227.
- Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods, 15*(3), 209.
- Probst, T. M. (2002). Layoffs and tradeoffs: Production, quality, and safety demands under the threat of job loss. *Journal of Occupational Health Psychology, 7*(3), 211–220.
- Probst, T. M. (2004). Safety and Insecurity: Exploring the Moderating Effect of Organizational Safety Climate. *Journal of Occupational Health Psychology, 9*(1), 3–10.
- Probst, T. M., & Brubaker, T. L. (2001). The effects of job insecurity on employee safety outcomes: Cross-sectional and longitudinal explorations. *Journal of Occupational Health Psychology, 6*(2), 139–159.

- Probst, T. M., Brubaker, T. L., & Barsotti, A. (2008). Organizational injury rate underreporting: The moderating effect of organizational safety climate. *Journal of Applied Psychology, 93*(5), 1147–1154.
- Qin, X., Hom, P., Xu, M., & Ju, D. (2014). Applying the job demands–resources model to migrant workers: Exploring how and when geographical distance increases quit propensity. *Journal of Occupational and Organizational Psychology, 87*(2), 303–328.
<https://doi.org/10.1111/joop.12047>
- Quinlan, M., & Bohle, P. (2009). Overstretched and unreciprocated commitment: reviewing research on the occupational health and safety effects of downsizing and job insecurity. *International Journal of Health Services, 39*(1), 1–44.
- Rasmussen, J. (1997). Risk management in a dynamic society: a modelling problem. *Safety Science, 27*(2), 183–213.
- Rayton, B. A., & Yalabik, Z. Y. (2014). Work engagement, psychological contract breach and job satisfaction. *The International Journal of Human Resource Management, 25*(17), 2382–2400.
- Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.
- Reason, J. (1998). Achieving a safety culture: Theory and practice. *Work & Stress, 12*, 293–306.
- Reason, J. (2004). *Managing the Risks of Organizational Accidents*. Cleveland. Retrieved from http://rmc.nasa.gov/archive/rmc_v/presentations/reason%20managing%20the%20risks%20of%20organizational%20accidents.pdf
- Reason, J., Parker, D., & Lawton, R. (1998). Organizational controls and safety: The varieties of rule-related behaviour. *Journal of Occupational and Organizational Psychology, 71*(4), 289–304.
- Reason, J., & Reason, J. (1997). *Managing the risks of organizational accidents* (Vol. 6). Ashgate Aldershot.
- Reis, H. T., & Gable, S. L. (2000). Event-sampling and other methods for studying everyday experience. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 190–222). Cambridge: Cambridge University Press.
- Reis, H. T., & Wheeler, L. (1991). Studying Social Interaction with the Rochester Interaction Record. *Advances in Experimental Social Psychology, 24*, 269–317.
- Restubog, S. L. D., Bordia, P., Tang, R. L., & Krebs, S. A. (2010). Investigating the moderating effects of leader–member exchange in the psychological contract breach–employee performance relationship: A test of two competing perspectives. *British Journal of Management, 21*(2), 422–437.
- Restubog, S. L. D., Zagenczyk, T. J., Bordia, P., Bordia, S., & Chapman, G. J. (2015). If you wrong us, shall we not revenge? Moderating roles of self-control and perceived aggressive work

- culture in predicting responses to psychological contract breach. *Journal of Management*, 41(4), 1132–1154.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: the cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, 79(3), 410.
- Rigotti, T. (2009). Enough is enough? Threshold models for the relationship between psychological contract breach and job-related attitudes. *European Journal of Work and Organizational Psychology*, 18(4), 442–463. <https://doi.org/doi:10.1080/13594320802402039>
- Roberts, S. E., & Marlow, P. B. (2005). Traumatic work related mortality among seafarers employed in British merchant shipping, 1976–2002. *Occupational and Environmental Medicine*, 62(3), 172–180.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, 128(6), 934.
- Robinson, S. L. (1996). Trust and Breach of the Psychological Contract. *Administrative Science Quarterly*, 41(4), 574–599. <https://doi.org/Article>
- Robinson, S. L., Kraatz, M. S., & Rousseau, D. M. (1994). Changing obligations and the psychological contract: A longitudinal study. *Academy of Management Journal*, 37(1), 137–152. <https://doi.org/Article>
- Robinson, S. L., & Morrison, E. W. (1995). Psychological contracts and OCB: The effect of unfulfilled obligations on civic virtue behavior. *Journal of Organizational Behavior*, 16(3), 289–298.
- Robinson, S. L., & Morrison, E. W. (2000). The Development of Psychological Contract Breach and Violation: A Longitudinal Study. *Journal of Organizational Behavior*, 21(5), 525–546.
- Robinson, S. L., & Rousseau, D. M. (1994). Violating the Psychological Contract: Not the Exception but the Norm. *Journal of Organizational Behavior*, 15(3), 245–259.
- Roehling, M. V. (1997). The origins and early development of the psychological contract construct. *Journal of Management History*, 3(2), 204–217.
- Rosenman, K. D., Kalush, A., Reilly, M. J., Gardiner, J. C., Reeves, M., & Luo, Z. (2006). How much work-related injury and illness is missed by the current national surveillance system? *Journal of Occupational and Environmental Medicine*, 48(4), 357–365.
- Rousseau, D. M. (1989). Psychological and implied contracts in organizations. *Employee Responsibilities and Rights Journal*, 2(2), 121–139.
- Rousseau, D. M. (1990). New hire perceptions of their own and their employer's obligations: A study of psychological contracts. *Journal of Organizational Behavior*, 11(5), 389–400.
- Rousseau, D. M. (1995). *Psychological contracts in organizations: Understanding written and unwritten agreements*. Thousand Oaks (CA); London; New Delhi: Sage Publications.

- Rousseau, D. M. (2001). Schema, promise and mutuality: The building blocks of the psychological contract. *Journal of Occupational and Organizational Psychology*, 74, 511–541.
- Rousseau, D. M. (2003). Extending the Psychology of the Psychological Contract: A Reply to 'Putting Psychology Back Into Psychological Contracts'. *Journal of Management Inquiry*, 12(3), 229–238.
- Rousseau, D. M. (2008). Psychological Contract Inventory: Employee and Employer Obligations. *The Heinz School-Carnegie Mellon University, USA*.
- Rousseau, D. M., & Tijoriwala, S. A. (1998). Assessing psychological contracts: Issues, alternatives and measures. *Journal of Organizational Behavior*, 19(S1), 679–695.
- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass*, 5(6), 359–371.
- Rundmo, T., Hestad, H., & Ulleberg, P. (1998). Organisational factors, safety attitudes and workload among offshore oil personnel. *Safety Science*, 29(2), 75–87.
[https://doi.org/10.1016/S0925-7535\(98\)00008-3](https://doi.org/10.1016/S0925-7535(98)00008-3)
- Russell, J. A., & Carroll, J. M. (1999). On the bipolarity of positive and negative affect. *Psychological Bulletin*, 125(1), 3.
- Sackett, P. R. (2002). The Structure of Counterproductive Work Behaviors: Dimensionality and Relationships with Facets of Job Performance. *International Journal of Selection and Assessment*, 10(1&2), 5–11.
- Sackett, P. R., & DeVore, C. J. (2001). Counterproductive behaviors at work. *Handbook of Industrial, Work, and Organizational Psychology*, 1, 145–164.
- Salancik, G. R., & Pfeffer, J. (1978). A Social Information Processing Approach to Job Attitudes and Task Design. *Administrative Science Quarterly*, 23(2), 224–253.
- Salgado, J. F. (2002). The Big Five Personality Dimensions and Counterproductive Behavior. *International Journal of Selection and Assessment*, 10(1/2), 117–125.
- Saloniemi, A., & Oksanen, H. (1998). Accidents and fatal accidents—some paradoxes. *Safety Science*, 29(1), 59–66. [https://doi.org/10.1016/S0925-7535\(98\)00016-2](https://doi.org/10.1016/S0925-7535(98)00016-2)
- Sampson, H., & Bloor, M. (2012). The effectiveness of global regulation in the shipping industry: a critical case study. *Revista Latino-Americana de Estudos Do Trabalho (RELET)*, 17(28), 45–72.
- Sampson, J. M., DeArmond, S., & Chen, P. Y. (2014). Role of safety stressors and social support on safety performance. *Safety Science*, 64(0), 137–145.
<https://doi.org/10.1016/j.ssci.2013.11.025>

- Schalk, R., & Roe, R. E. (2007). Towards a dynamic model of the psychological contract. *Journal for the Theory of Social Behaviour*, 37(2), 167–182.
- Schaufeli, W. B., & Maslach, C. (1993). Historical and conceptual development of burnout. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent developments in theory and research* (pp. 1–16). USA: Taylor & Francis.
- Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the Job Demands-Resources Model: Implications for improving work and health. In *Bridging Occupational, Organizational and Public Health: A Transdisciplinary Approach* (pp. 43–68). The Netherlands: Springer.
- Schein, E. H. (1965). *Organizational psychology*. Oxford, England: Prentice Hall.
- Schmeichel, B. J., & Vohs, K. (2009). Self-Affirmation and Self-Control: Affirming Core Values Counteracts Ego Depletion. *Journal of Personality & Social Psychology*, 96(4), 770–782. <https://doi.org/Article>
- Schmeichel, B. J., Vohs, K. D., & Baumeister, R. F. (2003). Intellectual performance and ego depletion: role of the self in logical reasoning and other information processing. *Journal of Personality and Social Psychology*, 85(1), 33.
- Schmitt, N. W., & Klimoski, R. J. (1991). *Research methods in human resources management*. Cincinnati, OH: South-Western.
- Schreurs, B. H., Hetty van Emmerik, I., Guenter, H., & Germeys, F. (2012). A weekly diary study on the buffering role of social support in the relationship between job insecurity and employee performance. *Human Resource Management*, 51(2), 259–279.
- Selig, J. P., & Preacher, K. J. (2009). Mediation models for longitudinal data in developmental research. *Research in Human Development*, 6(2–3), 144–164.
- Shockley, K. M., Ispas, D., Rossi, M. E., & Levine, E. L. (2012). A meta-analytic investigation of the relationship between state affect, discrete emotions, and job performance. *Human Performance*, 25(5), 377–411.
- Shore, L. M., & Barksdale, K. (1998). Examining degree of balance and level of obligation in the employment relationship: A social exchange approach. *Journal of Organizational Behavior*, 19(s 1), 731–744.
- Shore, L. M., & Tetrick, L. E. (1994). The psychological contract as an explanatory framework in the employment relationship. *Trends in Organizational Behavior*, 1(91), 91–109.
- Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology*, 1(1), 27.
- Simon, H. A. (1979). Rational Decision Making in Business Organizations. *The American Economic Review*, 69(4), 493–513.
- Smith, C. A., Organ, D. W., & Near, J. P. (1983). Organizational citizenship behavior: Its nature and antecedents. *Journal of Applied Psychology*, 68(4), 653–663.

- Smith, V. (2001). *Crossing the Great Divide: Worker Risk and Opportunity in the New Economy*. Ithaca: Cornell University Press.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, *13*(1982), 290–312.
- Sonnentag, S. (2003). Recovery, work engagement, and proactive behavior: a new look at the interface between nonwork and work. *Journal of Applied Psychology*, *88*(3), 518.
- Spector, P. E., & Fox, S. (2002). An emotion-centered model of voluntary work behavior: Some parallels between counterproductive work behavior and organizational citizenship behavior. *Human Resource Management Review*, *12*(2), 269–292.
[https://doi.org/10.1016/S1053-4822\(02\)00049-9](https://doi.org/10.1016/S1053-4822(02)00049-9)
- Spector, P. E., & Fox, S. (2010). Theorizing about the deviant citizen: An attributional explanation of the interplay of organizational citizenship and counterproductive work behavior. *Human Resource Management Review*, *20*(2), 132–143.
<https://doi.org/10.1016/j.hrmr.2009.06.002>
- Spence, J. R., Ferris, D. L., Brown, D. J., & Heller, D. (2011). Understanding daily citizenship behaviors: A social comparison perspective. *Journal of Organizational Behavior*, *32*(4), 547–571. <https://doi.org/10.1002/job.738>
- Stone-Romero, E. F., Alvarez, K., & Thompson, L. F. (2009). The construct validity of conceptual and operational definitions of contextual performance and related constructs. *Human Resource Management Review*, *19*(2), 104–116.
- Stride, C. B. (2010). *Structural Equation Modelling using MPlus*. University of Sheffield.
- Stucke, T. S., & Baumeister, R. F. (2006). Ego depletion and aggressive behavior: Is the inhibition of aggression a limited resource? *European Journal of Social Psychology*, *36*(1), 1–13.
- Sturges, J., Conway, N., Guest, D., & Liefoghe, A. (2005). Managing the career deal: the psychological contract as a framework for understanding career management, organizational commitment and work behavior. *Journal of Organizational Behavior*, *26*(7), 821–838. <https://doi.org/10.1002/job.341>
- Suazo, M. M. (2009). The mediating role of psychological contract violation on the relations between psychological contract breach and work-related attitudes and behaviors. *Journal of Managerial Psychology*, *24*(2), 136–160.
- Suazo, M. M., & Stone-Romero, E. F. (2011). Implications of psychological contract breach: A perceived organizational support perspective. *Journal of Managerial Psychology*, *26*(5), 366–382.
- Swuste, P., Gulijk, C. van, & Zwaard, W. (2010). Safety metaphors and theories, a review of the occupational safety literature of the US, UK and The Netherlands, till the first part of the

- 20th century. *Safety Science*, 48(8), 1000–1018. <https://doi.org/doi:10.1016/j.ssci.2010.01.020>
- Tabachnik, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (Sixth). Boston: Pearson Education Inc.
- Taylor, D. H. (1981). The hermeneutics of accidents and safety. *Ergonomics*, 24, 487–495.
- Tekleab, A. G., & Chiaburu, D. S. (2011). Social exchange: Empirical examination of form and focus. *Journal of Business Research*, 64(5), 460–466.
<https://doi.org/10.1016/j.jbusres.2010.03.005>
- Tekleab, A. G., & Taylor, M. S. (2003). Aren't there two parties in an employment relationship? Antecedents and consequences of organization–employee agreement on contract obligations and violations. *Journal of Organizational Behavior*, 24(5), 585–608.
<https://doi.org/10.1002/job.204>
- Tharaldsen, J.-E., & Haukelid, K. (2009). Culture and behavioural perspectives on safety - towards a balanced approach. *Journal of Risk Research*, 12(3/4), 375–388.
- Thompson, M., & Heron, P. (2006). Relational quality and innovative performance in R&D based science and technology firms. *Human Resource Management Journal*, 16(1), 28–47.
<https://doi.org/Article>
- Tice, D. M., Baumeister, R. F., Shmueli, D., & Muraven, M. (2007). Restoring the self: Positive affect helps improve self-regulation following ego depletion. *Journal of Experimental Social Psychology*, 43(3), 379–384.
- Torp, S., & Moen, B. (2006). The effects of occupational health and safety management on work environment and health: A prospective study. *Applied Ergonomics*, 37(6), 775–783.
- Totterdell, P., Wood, S., & Wall, T. (2006). An intra-individual test of the demands-control model: A weekly diary study of psychological strain in portfolio workers. *Journal of Occupational and Organizational Psychology*, 79(1), 63–84.
- Trougakos, J. P., Beal, D. J., Cheng, B. H., Hideg, I., & Zweig, D. (2015). Too drained to help: A resource depletion perspective on daily interpersonal citizenship behaviors. *Journal of Applied Psychology*, 100(1), 227.
- Tucker, S., Chmiel, N., Turner, N., Hershcovis, M. S., & Stride, C. B. (2008). Perceived Organizational Support for Safety and Employee Safety Voice: The Mediating Role of Coworker Support for Safety. *Journal of Occupational Health Psychology*, 13(4), 319–330.
<https://doi.org/Article>
- Tulving, E. (1972). Episodic and semantic memory 1. *Organization of Memory*. London: *Academic*, 381(4), 382–404.
- Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, 53(1), 1–25.

- Tuncel, S., Lotlikar, H., Salem, S., & Daraiseh, N. (2006). Effectiveness of behaviour based safety interventions to reduce accidents and injuries in workplaces: Critical appraisal and meta-analysis. *Theoretical Issues in Ergonomics Science*, 7(3), 191–209.
- Turner, A. N., & Lawrence, P. R. (1965). *Industrial jobs and the worker*. Harvard Univ.
- Turner, N., Chmiel, N., & Walls, M. (2005). Railing for Safety: Job Demands, Job Control, and Safety Citizenship Role Definition. *Journal of Occupational Health Psychology*, 10(4), 504–512.
- Turner, N., Stride, C. B., Carter, A. J., McCaughey, D., & Carroll, A. E. (2012). Job Demands–Control–Support model and employee safety performance. *Accident Analysis & Prevention*, 45(0), 811–817. <https://doi.org/10.1016/j.aap.2011.07.005>
- Turnley, W. H., Bolino, M. C., Lester, S. W., & Bloodgood, J. M. (2003). The impact of psychological contract fulfillment on the performance of in-role and organizational citizenship behaviors. *Journal of Management*, 29(2), 187–206.
- Turnley, W. H., & Feldman, D. C. (1999). The Impact of Psychological Contract Violations on Exit, Voice, Loyalty, and Neglect. *Human Relations*, 52(7), 895–922. <https://doi.org/10.1177/001872679905200703>
- Uen, J., Chien, M. S., & Yen, Y.-F. (2009). The mediating effects of psychological contracts on the relationship between human resource systems and role behaviors: A multilevel analysis. *Journal of Business and Psychology*, 24(2), 215–223.
- Ullman, J. B. (2013). Structural Equation Modeling. In B. G. Tabachnik & L. S. Fidell, *Using Multivariate Statistics* (Sixth, pp. 681–785). Boston: Pearson Education Inc.
- Van der Doef, M., & Maes, S. (1999). The job demand-control (-support) model and psychological well-being: a review of 20 years of empirical research. *Work & Stress*, 13(2), 87–114.
- van der Linden, D., Keijsers, G. P. J., Eling, P., & van Schaijk, R. (2005). Work stress and attentional difficulties: An initial study on burnout and cognitive failures. *Work & Stress*, 19(1), 23–36.
- Vantilborgh, T. (2015). Volunteers' reactions to psychological contract fulfillment in terms of exit, voice, loyalty, and neglect behavior. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 26(2), 604–628.
- Vantilborgh, T., Bidee, J., Pepermans, R., Willems, J., Huybrechts, G., & Jegers, M. (2014). Effects of ideological and relational psychological contract breach and fulfilment on volunteers' work effort. *European Journal of Work and Organizational Psychology*, 23(2), 217–230.
- Visser, E., Pijl, Y. J., Stolk, R. P., Neeleman, J., & Rosmalen, J. G. (2007). Accident proneness, does it exist? A review and meta-analysis. *Accident Analysis & Prevention*, 39(3), 556–564.
- Wagenaar, W., & Groeneweg, J. (1987). Accidents at sea: Multiple causes and impossible consequences. *International Journal of Man-Machine Studies*, 27(5), 587–598.

- Walker, A. (2013). Outcomes associated with breach and fulfillment of the psychological contract of safety. *Journal of Safety Research*, 47(0), 31–37.
<https://doi.org/10.1016/j.jsr.2013.08.008>
- Walker, A., & Hutton, D. M. (2006). The application of psychological contracts to workplace safety. *Journal of Safety Research*, 37, 433–441.
- Wall, T. D., Jackson, P. R., Mullarkey, S., & Parker, S. K. (1996). The demands—control model of job strain: A more specific test. *Journal of Occupational and Organizational Psychology*, 69(2), 153–166.
- Wallace, J. C., & Chen, G. (2005). Development and validation of a work-specific measure of cognitive failure: Implications for occupational safety. *Journal of Occupational & Organizational Psychology*, 78(4), 615–632.
- Wallace, J. C., & Chen, G. (2006). A multilevel integration of personality, climate, self-regulation and performance. *Personnel Psychology*, 59(3), 529–557. <https://doi.org/Article>
- Wallace, J. C., Johnson, P. D., & Frazier, M. L. (2009). An examination of the factorial, construct, and predictive validity and utility of the regulatory focus at work scale. *Journal of Organizational Behavior*, 30(6), 805–831. <https://doi.org/10.1002/job.572>
- Wallace, J. C., Kass, S. J., & Stanny, C. J. (2002). The Cognitive Failures Questionnaire Revisited: Dimensions and correlates. *Journal of General Psychology*, 129(3), 238–256.
- Wallace, J. C., & Vodanovich, S. J. (2003a). Can Accidents and Industrial Mishaps Be Predicted? Further Investigation into the Relationship between Cognitive Failure and Reports of Accidents. *Journal of Business and Psychology*, 17(4), 503–514.
<https://doi.org/10.2307/25092836>
- Wallace, J. C., & Vodanovich, S. J. (2003b). Workplace safety performance: Conscientiousness, cognitive failure, and their interaction. *Journal of Occupational Health Psychology*, 8(4), 316–327.
- Warr, P. (1987). *Work, Unemployment and Mental Health*. New York: Oxford University Press.
- Warr, P. (1990). The measurement of well-being and other aspects of mental health. *Journal of Occupational Psychology*, 63(3), 193–210.
- Waters, T. E., Bauer, P. J., & Fivush, R. (2014). Autobiographical memory functions served by multiple event types. *Applied Cognitive Psychology*, 28(2), 185–195.
- Weick, K. E. (1987). Organizational Culture as a Source of High Reliability. *California Management Review*, 29(2), 112–127.
- Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Straw & L. L. Cummings (Eds.), *Research in organizational behavior: An annual series of analytical essays and critical reviews* (Vol. 18, pp. 1–74). US: Elsevier Science/JAI Press.

- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: an evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement, 73*(6), 913–934.
- Wundt, W. (1907). *Outlines of psychology* (Third Revised English). Leipzig: W. Engelmann.
- Yukl, G. (1999). An evaluation of conceptual weaknesses in transformational and charismatic leadership theories. *The Leadership Quarterly, 10*(2), 285–305.
- Zacharatos, A., Barling, J., & Iverson, R. D. (2005). High-Performance Work Systems and Occupational Safety. *Journal of Applied Psychology, 90*(1), 77–93.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist, 35*(2), 151–175.
- Zajonc, R. B. (1998). Emotions. In D. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (Vol. 1, pp. 591–632). New York: McGraw-Hill.
- Zhao, H., Wayne, S. J., Glibkowski, B. C., & Bravo, J. (2007). The impact of psychological contract breach on work-related outcomes: A meta-analysis. *Personnel Psychology, 60*(3), 647–680.
- Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research, 37*(2), 197–206.
- Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology, 85*(4), 587–596.
- Zohar, D. (2002a). Modifying supervisory practices to improve subunit safety: A leadership-based intervention model. *Journal of Applied Psychology, 87*(1), 156–163.
- Zohar, D. (2002b). The effects of leadership dimensions, safety climate, and assigned priorities on minor injuries in work groups. *Journal of Organizational Behavior, 23*(1), 75–92.
- Zohar, D. (2010). Thirty years of safety climate research: Reflections and future directions. *Safety Climate: New Developments in Conceptualization, Theory, and Research, 42*(5), 1517–1522. <https://doi.org/10.1016/j.aap.2009.12.019>
- Zohar, D., & Tenne-Gazit, O. (2008). Transformational leadership and group interaction as climate antecedents: a social network analysis. *Journal of Applied Psychology, 93*(4), 744.

Appendix A: Factor scores and item loadings

Confirmatory Factor Loadings and Average Variance Extracted

Construct	AVE	Indicators			
		1	2	3	4
Time I					
Psychological Contract Fulfilment	.89	.81	.96	.80	
Global Breach	.42	.67	.85	.46	.45
Production SRF	.46	.80	.65	.55	
Prevention SRF	.62	.70	.82	.84	
Antecedent ERS	.44	.75	.59	.63	
Response ERS	.57	.73	.79	.75	
Psychological contract violation	.71	.84	.88	.78	.85
Psychological Well-being	.57	.78	.82	.64	
Cognitive failure	.51	.68	.81	.73	.61
Core Safety Behaviour	.57	.75	.86	.80	.59
Safety Citizenship Behaviour – Individual	.56	.78	.90	.93	
Safety Citizenship Behaviour – Organisation	.56	.84	.89	.82	
Unsafe Behaviour	.64	.71	.88	.80	
Time II					
Psychological Contract Fulfilment	.78	.86	.95	.83	
Global Breach	.42	.73	.92	.41	.36
Production SRF	.45	.86	.65	.43	
Prevention SRF	.73	.78	.91	.87	
Antecedent ERS	.48	.71	.72	.64	
Response ERS	.51	.76	.72	.66	
Psychological contract violation	.74	.86	.87	.85	.86
Psychological Well-being	.62	.79	.74	.83	
Cognitive Failure	.58	.77	.85	.77	.65
Core Safety Behaviour	.58	.81	.88	.80	.50
Safety Citizenship Behaviour – Individual	.75	.75	.90	.93	
Safety Citizenship Behaviour – Organisation	.73	.85	.89	.83	
Unsafe Behaviour	.66	.75	.88	.82	

Notes. AVE = Average Variance Extracted. SRF = Self-Regulatory Focus. ERS = Emotion Regulation Strategy

Appendix B: Null and unconditional models

Modelling between- and within-person variance

Criterion	ICC(1)	Null Model	Model 1 Unconditional model	Model 2 Unconditional linear growth	Model 3 Unconditional linear random slopes	Model 4 Autoregression
Psychological contract violation	0.62	1030.92	744.08	746.61	728.47	702.65
Cognitive failure	0.73	-177.84	-561.73	-564.21	-567.04	-567.38
Pleasant mood	0.78	1342.48	847.63	855.51	808.75	788.59
Unpleasant mood	0.62	748.28	461.94	448.53	434.40	429.21
Core safety behaviour	0.71	1591.26	1211.21	1195.12	1162.07	1158.19
Safety citizenship individual	0.73	1667.07	1309.14	1307.65	1290.46	1290.42
Safety citizenship organisation	0.66	1672.03	1371.18	1352.81	1324.35	1323.36
Unsafe behaviour	0.82	1371.63	813.51	814.71	806.29	806.10

Note. Model 1 allows the intercept term to vary by employee. Model 2 adds the fixed effect of time. Model 3 allows the intercept to vary by time and employee. Model 4 adds an autoregressive component to establish the extent of correlation between observations.

Appendix C: Survey questionnaire

Welcome to the Safety at Sea Research Study

This research examines the emotional ups and downs of life at sea and its impact on safety. It examines how the quality of the relationship with an employer and different events impact on how seafarers (officers and crew) feel about their work and how much energy and enthusiasm they have to carry out their job, particularly the safety aspects of their job.



I am Claire Pekcan and this study is part of my PhD research. I am a senior lecturer at Warsash Maritime Academy (WMA) in the UK, a campus of Southampton Solent University. At WMA, we specialise in education and training for merchant navy personnel and have done so for the past 75 years. I have worked there for 16 years teaching human factors and researching human element issues, such as fatigue. (You can search on Google to find out more about Warsash Maritime Academy and me).

Your company has agreed to help me with my research and has given me permission to contact its officers and crew. Your company is keen to establish how its relationship with its seafarers influences behaviour on-board. You / your ship have been randomly chosen and approached to help with this research.

I will be contacting at least 3,000 people across several companies to help me with my project. The survey will take about 20 minutes to complete and is totally confidential. Only I will see the individual data generated.

I will supply your company with an aggregate report (by reporting only combined results and never reporting individual ones) that focuses on the factors that are important to its officers and crew, how people feel about the deal they have with the company, and how changes to the deal influence how they feel and how they behave. Your company will not be able to identify you from the information I give them, nor will it be able to identify any ships.

I really hope you will feel willing and able to take part in this survey as the data it generates will raise awareness in the maritime industry about how the quality of the employment relationship affects how seafarers feel and behave. I cannot guarantee that my research will make your life better or indeed that it will change the way the maritime industry works, but it will help us all to understand the factors that can improve seafarers' working lives and safety at sea.

Thank you in anticipation of your agreement to take part.

Kind regards,

Claire Pekcan (Associate Professor)
Senior Lecturer, Warsash Maritime Academy
Newtown Road, Warsash
Southampton, SO31 5BR UK
Tel: +44(0)1489 556145 Email: claire.pekcan@solent.ac.uk

On the next page, I will explain more about the survey and exactly how I will treat the information you give me.



Confidentiality Statement

Your company has given its permission that the questionnaire can be completed during work time. **Please complete this survey before 31 August 2013.**

Risks/Discomforts: The risks are minimal for involvement in this study. However, you may feel that answering questions about how you feel may bring back things to mind that you have forgotten about.

Benefits: There are no direct benefits for participants. However, it is hoped that through your participation, we will learn more about what makes seafarers happy, healthy, and safe.

Compensation: There is no direct compensation, however, participants may receive their own copy of the results by emailing me: claire.pekcan@solent.ac.uk

Confidentiality

All data obtained from participants will be kept confidential and will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones). Your responses are anonymised and no individual will be identifiable, nor will any ship be identifiable. Furthermore, it will not be possible to identify any individual responses in any analysis or report. All questionnaires will be concealed, and no one other than myself and my PhD supervisor Professor Neil Conway (details below), will have access to them. The data collected will be stored on a password protected computer until it has been deleted by me, Claire Pekcan. Only myself and my supervisor will have access to this data. I will share more detailed information with my PhD supervisor only. His details are listed below. Professor Neil Conway, Department of Management, Royal Holloway College, University of London (neil.conway@rhul.ac.uk)

Participation

Participation in this research study is completely voluntary. Participation in the full survey will involve completing two questionnaires over time: this involves completing this questionnaire and one other early in 2014. Each questionnaire will be coded with your security code so that it can be paired with the questionnaire you will receive in 2014 without the need to collect personally identifiable information. You have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your employment status or your standing with your employer. If you desire to withdraw after you have completed this survey, please notify me at this email address claire.pekcan@solent.ac.uk, quoting your questionnaire security code, which will you will be asked to create in the questionnaire. You do not have to give a reason.

How will my privacy be protected? Any information held on computer or in a database identifying employees will be separated from the data sets and will be destroyed at the end of the data gathering phase of the research in February 2014 and will never be passed to your company or any third parties. Following completion of the data gathering phase, contact details will be detached from the questionnaires and shredded.

Questions about the research : If you have questions regarding this study, you may contact me, Claire Pekcan on +44 (0) 7795622910 or email: claire.pekcan@solent.ac.uk

Questions about your rights as research participants: If you have questions you do not feel comfortable asking me, you may contact my supervisor, Professor Neil Conway (Professor of Organizational Psychology at Royal Holloway College, University of London), neil.conway@rhul.ac.uk Thank you for taking the time to participate in this research.

Q1.0 [I have read and understood the above consent form and desire of my own free will to participate in this study.](#)

- Yes
- No

If No Is Selected, Then Skip To End of Survey

Instructions for Completing the Survey

This survey is a questionnaire that asks you about your relationship with your employer, experiences at work, how you feel about your work, and how you approach different aspects of your work.

Some questions may seem similar, but are in fact different, and thus you are asked to treat each question as you find it. You do not need to try to be consistent or remember what you said before. Answer each question as quickly and honestly as you can. Your first reaction to the question is usually the most relevant.

There are no wrong or right answers and you will not be judged on any of your answers.

It is best to try and complete the questionnaire in one go. It will take you roughly 20 minutes. Your information is very important to me and my study as the more responses I receive, the much stronger my study will be. A stronger study will enable me to make more credible, stronger recommendations.

Create your questionnaire security code

In order that I can match up your responses with the questionnaire that will come round in February 2014, I need you to create a security code that will only be known by you.

- In the first box, please enter in the box below the **day of the month** that you were born on. I was born on 14 November, so I would enter 14.
- In the second box, enter the **first two letters of the city**, town or village in which you were born. I was born in London, so I would enter LO
- In the last box, **enter your height**. I'm 163 cm so I would enter 163.

1. Day of the month you were born _____
2. First 2 letters of the city, town or village you were born in _____
3. Your height in cm or ft and in _____

On the next page, you will find the start of the survey...

Section 2: Employer Commitments and Obligations

In this first section, I am going to ask you about the extent to which you feel your employer has met its commitments or obligations to you.

Employers make promises to give employees certain things in exchange for their contribution to the organization. These promises can be implied or they can be explicit. For example, you may have been told something explicitly when you were hired or you may have just come to an understanding about the commitments and obligations that are owed to you through your employer's dealings with you or through the company's marketing material or policy statements.

Please indicate the extent to which your employer (or someone acting on your employer's behalf) has met its obligations to you. Please use the scale ranging from 1 'Fallen far short of its obligations' through to 5 'Far exceeded its obligations'.

No promise made option: If your employer has not made any promises on the item listed or you do not feel your employer is obliged to provide the item listed, please write 9 to indicate 'No promise made'.

Q2.1 How well has your employer met its obligations and commitments on the items listed?

Please answer the questions using the following scale:					
9	1	2	3	4	5
No promise made	Fallen far short of its obligations	Fallen short of its obligations	Met its obligations	Exceeded its obligations	Far exceeded its obligations

- _____ Fair pay for the level of accountability and responsibility in the job
- _____ Fair pay compared to employees doing similar work in other organizations
- _____ Regular benefits and extras
- _____ Wages and benefits that I can count on
- _____ Timely relief at the end of my contract / tour of duty / assignment
- _____ Reasonable workload (administrative and technical)
- _____ Well-defined job responsibilities
- _____ Facilities and opportunities for rest and recreation while at sea
- _____ Facilities and opportunities to communicate with family and friends while at sea
- _____ Good career prospects
- _____ Opportunities to develop new skills
- _____ Opportunities for promotion and advancement
- _____ Increasing responsibilities
- _____ Support with personal problems
- _____ Trust and respect
- _____ A good atmosphere at work

Q2.2 How well has your employer met its obligations and commitments on the items listed?

Please answer the questions using the following scale:

9	1	2	3	4	5
No promise made	Fallen far short of its obligations	Fallen short of its obligations	Met its obligations	Exceeded its obligations	Far exceeded its obligations

- _____ Respect for my personal situation
- _____ To be responsive to my personal concerns and well-being
- _____ Fair and impartial treatment
- _____ Up to date training and development
- _____ The necessary training to do my job well
- _____ Counsel employees who break safety rules
- _____ Involve employees in safety decision making
- _____ Listen to employee safety concerns
- _____ Inform employees about the outcome of safety meetings
- _____ Carry out safety incident investigations to prevent incidents happening again
- _____ Set a good example for safety behaviour
- _____ Ensure that safety documentation details safety procedures
- _____ Conduct regular safety training with all employees
- _____ Keep work equipment functioning properly
- _____ Supply proper work equipment
- _____ Provide training in the safe use of work equipment
- _____ Maintain a safe workplace
- _____ Supply enough human resources to get the job done safely
- _____ Ensure that safety incident investigations do not focus on blame

Q2.3 Overall, how well has your employer kept its promises to you?

In this section, please state the extent to which you agree with the following statements about how well your employer has kept its promises overall.

Please answer the questions using the following scale:				
1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

- _____ Almost all the promises made by my employer during recruitment have been kept so far
- _____ I feel that my employer has come through in fulfilling the promises made to me when I was hired
- _____ I have not received everything promised to me in exchange for my contributions
- _____ My employer has broken many of its promises to me even though I've upheld my side of the deal

Section 3: Feelings Towards Employer

Q3.1 How do you feel about your employer?

In this next section, you are asked to indicate the extent to which you agree with the following statements about how you feel about your employer.

Please answer the questions using the following scale:				
1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

- _____ I feel a great deal of anger toward my employer
- _____ I feel betrayed by my employer
- _____ I feel that my employer has violated the contract between us
- _____ I feel extremely frustrated by how I have been treated by my employer

Section 4: Memory and Attention

Q4.1 How often do you do the following?

Listed below are a number of statements describing lapses of memory and attention that we all suffer to varying degrees. In this section, I want you to think about the statements and indicate how often you do what is being described.

Please answer the questions using the following scale:				
1	2	3	4	5
Never	Rarely	Sometimes	Often	All of the Time

Please indicate how often you do the things listed

- _____ Do you find you forget appointments?
- _____ Do you find you accidentally throw away the thing you want to keep and keep the thing you meant to throw away?
- _____ Do you forget where you put something like a document or a file?
- _____ Do you find you read something and find you haven't been thinking about it and must read it again?
- _____ Do you have trouble making up your mind?
- _____ Do you find you forget why you went from one part of the house / ship to the other?
- _____ Do you fail to hear people speaking to you when you are doing something else?
- _____ Do you say something and then realise after wards that it might be taken as insulting?
- _____ Do you lose your temper and regret it?
- _____ Do you find you forget people's names?
- _____ Do you fail to listen to people's names when you are meeting them?

Section 5: Feelings and Emotions

Q5.1 How do you manage your feelings and emotions?

In this section, I am going to ask you how you manage your feelings and emotions. People use different strategies to manage feelings and emotions and use some strategies more than others. Below, you will be presented with a series of strategies. I want you to think back over the last month and indicate how often you have used the strategy described to manage your feelings and emotions.

In the last month, how often have you used the strategy listed to manage your feelings and emotions?

Please answer the questions using the following scale:						
0	1	2	3	4	5	6
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

- | | |
|---|--|
| <p>_____ Sought out individuals that make me feel good</p> <p>_____ Avoided a situation that I know will make me feel bad</p> <p>_____ Tried to solve the problem</p> <p>_____ Removed myself from the situation</p> <p>_____ Kept myself busy working on other things</p> <p>_____ Did something enjoyable to improve my mood</p> <p>_____ Found humour in the situation</p> | <p>_____ Thought about how the other person feels</p> <p>_____ Reminded myself that I can't control everything</p> <p>_____ Pretended I am in a good mood</p> <p>_____ Hidden how I really feel</p> <p>_____ Thought about the situation over and over</p> <p>_____ Continued to think about the situation wishing it had gone differently</p> <p>_____ I couldn't stop thinking about how I was feeling</p> |
|---|--|

Q5.2 How often do you focus on these when working?

In this section, there follows a series of thoughts that you might have while working. I will ask you to indicate how often you focus on these thoughts and activities when you are working. Please rate how often you focus on these thoughts and activities when you are working...

Please answer the questions using the following scale:						
0	1	2	3	4	5	6
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

- _____ Accomplishing a lot at work
- _____ Getting a lot of work finished in a short amount of time
- _____ How many job tasks I can complete
- _____ Doing my duty at work
- _____ Completing work tasks correctly
- _____ Fulfilling my work obligations

Section 6: General Safety Duties

Q6.1 How frequently could you be expected to do the following general safety duties?

For the next 4 sections, you are asked to rate how frequently you could be expected to do, when required, the general safety duties listed. Each section looks at a different aspect of general safety duties. There will be times when employees can always be expected to do the duties listed. There may be other times when they find it difficult to do the duties listed. You are asked to indicate, in general, how frequently you could be expected to do the duty listed, when required.

There are no right or wrong answers and you will not be judged on your answer.

Please answer the questions using the following scale:						
0	1	2	3	4	5	6
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

Q6.1.1 Using Personal Protective Equipment:

Using respiratory equipment and protective clothing to shield or isolate individuals from chemical, physical, and biological hazards that may be encountered, when engineering and work controls are not feasible to control exposure.

Please indicate as honestly as possible the **frequency** with which you could be expected to do the following when required:

- _____ Use the correct PPE (personal protective equipment) as indicated by the safety management system.
- _____ Put on all PPE correctly.
- _____ Perform work properly while wearing the PPE.

Q6.1.2 Engaging in Work Practices to Reduce Risk:

Performing tasks to assure safety to those involved, the environment, and the nearby community using barriers, isolation, equipment, and other methods to minimize hazards.

Please indicate as honestly as possible the **frequency** with which you could be expected to do the following when required:

- _____ Follow the correct work practices and procedures to reduce exposure to hazards and risks.
- _____ Take the necessary precautions and follow permit requirements for confined / enclosed space work.
- _____ Practice safe spill handling procedures.

Q6.1.3 Communicating Health and Safety Information:

Communicating hazard, incident, accident, and/or illness information to appropriate personnel. Please indicate as honestly as possible the frequency with which you could be expected to do the following when required:

Please answer the questions using the following scale:						
0	1	2	3	4	5	6
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

Please indicate as honestly as possible the **frequency** with which you could be expected to do the following when required:

- _____ Inform key personnel responsible for on board health and safety about potential exposure(s).
- _____ Report all incidents, accidents, near-misses, and/or illnesses.
- _____ Notify workers, supervisors, and/or emergency coordinators of emergency conditions.

Q6.1.4 Exercising Employee Rights and Responsibilities:

Exercising rights and responsibilities pertaining to laws and regulations.

Please indicate as honestly as possible the **frequency** with which you could be expected to do the following when required:

- _____ Consult reference materials for additional information on health and safety (e.g., Code of Safe Working Practice).
- _____ Contact senior management and provide input into altering on-board safety management.
- _____ Contact the Designated Person Ashore / shore-side management if prevented from or punished for exercising my rights under the ISM Code on-board.

Section 7: Safety-Related Activities

Q7.1 How frequently could you be expected to carry out the following safety-related activities?

In this next block, there are two sections that look at additional safety behaviours that may or may not be part of your core job responsibilities.

As with the previous section, there will be times when employees can always be expected to do the activities listed. There may be other times when they find it difficult to do the duties listed. You are asked to indicate, in general, how frequently you could be expected to do the activity listed, when needed.

There are no right or wrong answers and you will not be judged on the answer you provide.

Please answer the questions using the following scale:						
0	1	2	3	4	5	6
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

Please indicate as honestly as possible the **frequency** with which you could be expected to do the following when needed:

Q7.1.2

- _____ Help teach safety procedures to new crew members
- _____ Assist others to make sure they perform their work safely
- _____ Go out of my way to look out for the safety of other crew members
- _____ Take action to prevent safety violations in order to protect the well-being of other crew members
- _____ Try to prevent other crew members from being injured on the job
- _____ Take action to protect other crew members from risky situations.

Q7.1.3

- _____ Raise safety concerns during work planning sessions
- _____ Express opinions on safety matters even if others disagree
- _____ Keep informed of changes in safety policies and procedures
- _____ Make suggestions to improve safety on-board
- _____ Report crewmembers who violate safety procedures
- _____ Try to change the way the job is done to make it safer

Section 8: Your Job

Q8.1 How does your job make you feel?

Listed below are a number of words that describe both positive and negative feelings.

Please answer the questions using the following scale:					
0	1	2	3	4	5
Never	Occasionally	Some of the Time	Much of the Time	Most of the Time	All of the Time

Please read each word and then, **thinking of the past few weeks**, indicate how much of the time **your job** has made you feel each of the feelings listed:

_____ Tense	_____ Relaxed
_____ Enthusiastic	_____ Depressed
_____ Miserable	_____ Uneasy
_____ Worried	_____ Cheerful
_____ Calm	_____ Gloomy
_____ Contented	_____ Optimistic

Q8.2 How often do you find yourself in the situation described?

In the next section, you are asked to indicate the frequency with which you find yourself in situations at work. These are situations that happen at work to different degrees. There are no right or wrong answers and you will not be judged on your answer.

Please answer the questions using the following scale:						
0	1	2	3	4	5	6
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

Please indicate as honestly as possible **how often** you find yourself in the situations described below:

I find...

- _____ I ignore safety regulations to get the job done
- _____ I take chances to get the job done
- _____ I bend the rules to achieve a target
- _____ I get the job done better by ignoring some rules
- _____ I take shortcuts that involve little or no risk
- _____ I follow orders knowing them to be wrong

Section 9: Accidents and Near-misses

In the next section I am going to ask you about accidents and near-misses that you may or may not have had while working for your current employer.

Q9.1 Have you ever had an accident working on any of your current employer's ships that required medical attention?

- Yes
- No

If No Is Selected, Then Skip To Q9.7: How many near misses have you been in...

Q9.2 When was the last time you had an accident where you needed medical attention?

- Within 6 months
- Within 1 year
- More than 1 year

Q9.3 How many accidents have you had in the last 2 years?

- One
- Two
- Three
- Four or more

Q9.4 Have you had an accident on this ship (or if not on-board, your last ship)?

- Yes
- No

If No Is Selected, Then Skip To Q9.7 How many near misses have you been in...

Q9.5 Who initiated the accident?

- Yourself
- Work group member
- Crew member

Q9.6 What was the severity of the accident?

- Serious (> 45 days off work)
- Lost time (>3 days off work)
- Medical treatment (minor)
- First aid injury (minor)

Q9.7 How many near misses have you been involved in during the last 2 years?

- None
- One
- Two
- Three
- Four or more

If None Is Selected, Then Skip To Section 10: Health and Lifestyle

Q9.8 What might have been the worst probable outcome for the most severe near-miss that you have been involved in?

- Fatality
- Serious Injury (>45 days off work)
- Lost time injury (>3 days off work)
- Medical treatment (minor)
- First aid injury (minor)

Q9.9 How many near misses have you been involved in on your current ship (or if not on-board, your last ship)?

- None
- One
- Two
- Three
- Four or more

If None Is Selected, Then Skip To Section 10: Health and Lifestyle

Q9.10 What might have been the worst probable outcome for the most severe near-miss that you have been involved in on board this ship (or if not on-board, your last ship)?

- Fatality
- Serious Injury (>45 days off work)
- Lost time injury (>3 days off work)
- Medical treatment (minor)
- First aid injury (minor)

Section 10: Health and Lifestyle

The following section contains questions about your health and lifestyle. There are questions about exercise, medical conditions, tobacco and alcohol consumption.

Q10.1 Exercise In the past month, how frequently have you taken 20 minutes of aerobic exercise?

- None
- Less than once a week
- Once a week
- Two times a week
- Three times a week
- More than three times a week

Q10.2 Have you been diagnosed by your doctor as having any of these medical conditions (please tick all that apply)...

- High blood pressure
- Diabetes
- High cholesterol
- None of the above

Q10.3 Tobacco consumption How many cigarettes do you smoke per day?

- None
- 1 - 10
- 11 - 20
- 21 - 40
- 41 - 60
- 60 +

Q10.4 Alcohol Consumption In the past 28 days (approx 1 month), on how many days did you have an alcoholic drink?

- 0 days
- 1 day
- 2 - 7 days
- 7 - 14 days
- 15 - 21 days
- 21 + days

If 0 Days is Selected, Then Skip to Section 11: Demographic Information

Q10.5 On day(s) that you drank alcohol, how many drinks did you normally have?

- 1
- 2-5
- 6-10
- 10+

Section 11: Demographic Information

In this section, I will ask you information about yourself such as your nationality, age, type of contract you have, etc. This will enable me to group the answers so that I can compare, for example, responses from people of different ages, nationality and types of contract.

Q11.1 Are you?

- Male
- Female

Q11.2 How old are you?

- < 20
- 20 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60 - 69
- 70 +

Q11.3 How long have you worked for your current employer?

- < 1 year
- 1 - 2 years
- 3 - 5 years
- 6 - 10 years
- 11 - 20 years
- 21 - 30 years
- 31+ years

Q11.4 What is your country of origin?

Q11.5 How long have you been a seafarer / worked at sea?

- < 1 year
- 1 - 2 years
- 3 - 5 years
- 6 - 10 years
- 11 - 20 years
- 21 - 30 years
- 31+ years

Q11.6 What is your pattern of work, or your work : leave ratio?

- 1:1 one days leave for every day worked (e.g. 1 month on ship, 1 month off or 6 weeks on 6 weeks off)
- 2:1: one days leave for every two days worked (e.g. 2 months on ship, 1 month off)
- 3:1: one days leave for every three days worked (e.g. 3 months on ship, 1 month off)
- 4:1 one days leave for every four days worked (e.g. 4 months on ship, 1 month off)
- Other, please specify in weeks / months on and weeks / months off _____

Q11.7 What is the typical length of your contract / tour of duty on-board ship?

- 0 - 5 weeks
- 6 - 10 weeks
- 11 - 20 weeks
- More than 20 weeks but less than 6 months
- More than 6 months but less than 1 year
- More than 1 year but less than 2 years
- More than 2 years
- Other, please specify _____

Q11.8 What type of contract do you have?

- Permanent salaried (paid monthly even when on leave)
- Permanent (but NOT paid when ashore on leave)
- Temporary fixed contract
- Crewing agency contract
- Trainee / Apprentice / Cadet
- Other, please specify _____

Q11.9 Are you a member of a union?

- Yes
- No

Q11.10 How many dependents do you have (partner / children / extended family)?

- 0
- 1-5
- 6-10
- 10+

Q11.11 Where are you currently?

- At sea
- Ashore on leave
- Ashore in the office
- Other, please specify... _____

Answer Q11.12 If Where are you currently? At sea is Selected

Q11.12 How long have you been on-board your current ship?

- 1 week or less
- 2 - 3 weeks
- 1 - 2 months
- 3 - 4 months
- 5 - 6 months
- 7 - 12 months
- More than 12 months

Answer Q11.13 If Where are you currently? At sea is not Selected

Q11.13 How long have you been ashore?

- 1 week or less
- 2 - 3 weeks
- 1 - 2 months
- 3 - 4 months
- 5 - 6 months
- 7 - 12 months
- More than 12 months

Q11.14 What is the highest level of education you have completed?

- Less than High School
- High School / GED
- Some College
- 2-year College Degree
- 4-year College Degree
- Masters Degree
- Doctoral Degree
- Professional Degree (JD, MD)

Q11.15 What is your current role?

- Manager (e.g. Master or Chief Engineer or Head of Department)
- Deck Officer
- Deck Crew
- Engine Officer
- Engine Crew
- Galley Officer
- Galley Crew
- Other, Please specify _____

Section 12: Additional Data

Q12.1 Invitation to participate in the diary study

In addition to the survey you have just completed, I am looking for volunteers to participate in a diary study.

The diary study will take place in September 2013 when people are on-board ship. Questionnaires taken at one or two points in time provide us with very useful information, but they are reliant on our memory of events. A diary study records experiences, thoughts and feelings on a day-to-day basis and thus is less likely to be distorted by memory. The diary study is a daily record of the events, feelings, and actions that you experience while on-board ship.

You are invited to participate in this diary study to explore your day-to-day experiences on-board ship.

This is a vital piece of my research and will involve completing short answers to questions on a daily basis for a period of 14 days. The diary will only take from 5 to 10 minutes to complete each day.

If you are likely to be on-board ship in September, would you be willing to participate in the diary study?

- Yes
- No

Q12.2 Request for access to performance and attendance data

In this questionnaire, I have asked you about your own thoughts and feelings about your work and what you do. It would be of great scientific value if I could marry this information up with data collected by your employer about your performance and attendance. I would like to gather data covering one year before and six months after the date of this survey.

As with this survey, all information provided will be treated with the strictest confidence. Your anonymity will be maintained at all stages as per my confidentiality statement at the beginning of this questionnaire.

All data will be held on a password-protected server, compliant with UK data protection law, and to which only my PhD supervisor and I have access. Your participation is entirely voluntary and you are free to withdraw at anytime without giving a reason.

If you agree that your employer can provide information relating to performance and attendance, please indicate below.

I agree to my employer providing Claire Pekcan of Southampton Solent University information as identified below and covering the period specified (please tick one or both boxes if you agree to your employer releasing this information):

- Performance information (e.g. rating in your last appraisal) 2011/12; 2012/13
- Attendance information (e.g. number of days absent but not reasons for absence for 2011/12 and 2012/13)

Q12.3 Answer the next question only if you answered Yes to participation in the diary study or to the release of performance / attendance data

Thank you very much for volunteering to take part in the diary study / agreeing to release performance or attendance data.

In order that I can locate which ship you are on when the diary study takes place, or so that I can email you a copy of the diary study before you join ship, please can you give me the following pieces of information so that I can email you / send to you the sheets for completing:

- Your employee number or payroll number *
- Your personal email address*

If you have only agreed to performance or attendance data being released, then please just complete your employee number or payroll number.

Just to re-iterate that this information is not visible to your company or any co-worker. It will only be used to enable me to send you a link for the diary study when you are on-board ship or access your data.

My employee / payroll number is.... _____

My email address is.... _____

* If you do not want to write this information here, please email me directly at claire.pekcan@solent.ac.uk quoting your questionnaire security code.

This is the end of the survey.

Thank you for taking the time to complete this questionnaire. Your help is very much appreciated and will help contribute to our understanding of what makes seafarers happy, healthy and safe.

If you are filling in a paper copy of this questionnaire, please place your completed questionnaire in an envelope, mark it Private & Confidential and post it to me at the address below.

If you have completed your survey on-line, then you do not need to do any more. Your completed questionnaire will be emailed to me directly. If you would like a copy of the results or have any questions regarding the survey, please email me on the email address below.

Kind regards,

Claire

Claire Pekcan
Warsash Maritime Academy,
Newtown Road, Southampton, SO31 9ZL
UK

Tel: +44(0)1489 556145

Email: claire.pekcan@solent.ac.uk

Appendix D: Daily diary

Welcome to the Safety at Sea Diary Study

Thank you for volunteering to participate in the diary study. The diary asks you about your daily experiences at work. I am interested in **daily events, no matter how big or small**, which happened to you at work today. **A daily event is defined as either a positive or negative event, communication, observation or interaction which gives you information about your employer's commitments and obligations to you.**

I need your responses over a period of **14 days** and I will send you a link each day for completing the diary until I have 14 responses from you. If at the end of the 14 days you are willing to continue that would be fantastic, but you are not obliged to do this. I will ask you on day 14 how you feel about continuing with the diary study.

Completing the diary will take about 5 minutes if you have nothing to report. It will take about 15 minutes if you report an event that has happened to you. The first couple of days filling in the diary might take a bit longer, but as you get used to the questions, it should take you less time.

Please answer the questions as quickly and honestly as you can. It is better not to spend too much time thinking about your response as your first reaction is usually the most relevant. Please **only** skip a question if it does not apply to you or you don't know the answer. Please only use the link that was emailed to you personally today so that I can track your responses over time.

As with the survey, this diary is totally confidential.

Thank you for taking the time to participate in this research. I am very grateful to you for giving your time in this way. Your efforts will certainly help us understand the emotional ups and downs of life at sea and how the relationship with an employer has an impact on how seafarers feel and behave.

If you have any queries or would like more information about this research project, please email me at claire.pekcan@solent.ac.uk

I hope you enjoy the diary experience.

Kind regards,

Claire

Claire Pekcan (Associate Professor)
Senior Lecturer, Warsash Maritime Academy
Newtown Road, Warsash
Southampton, SO31 5BR
UK
Tel: +44(0)1489 556145
Email: claire.pekcan@solent.ac.uk

On the next couple of pages, I will give you definitions and examples of employers exceeding and failing to meet their obligations...

Confidentiality Statement

Risks/Discomforts: The risks are minimal for involvement in this study. However, you may feel that answering questions about how you feel may bring back things to mind that you have forgotten about.

Benefits: There are no direct benefits for participants. However, it is hoped that through your participation, we will learn more about what makes seafarers happy, healthy, and safe.

Compensation: There is no direct compensation, however, participants may receive their own copy of the results by emailing me: claire.pekcan@solent.ac.uk

Confidentiality

All data obtained from participants will be kept confidential and will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones). Your responses are anonymised and **no individual** will be identifiable, nor will any ship be identifiable. Furthermore, it will **not** be possible to identify any individual responses in any analysis or report.

All questionnaires will be concealed, and no one other than myself and my PhD supervisor Professor Neil Conway (details below), will have access to them. The data collected will be stored in the Qualtrics-secure database until it has been deleted by me, Claire Pekcan. Only myself and my supervisor will have access to this database. All data will be held on a password protected server, compliant with UK data protection laws. I will share more detailed information with my PhD supervisor **only**. His details are listed below.

Professor Neil Conway, Department of Management, Royal Holloway College, University of London (neil.conway@rhul.ac.uk)

Participation

Participation in this research study is completely voluntary.

You have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your employment status or your standing with your employer. If you desire to withdraw after you have completed this survey, please notify me at this email address claire.pekcan@solent.ac.uk, quoting your questionnaire security code, which will you will be asked to create in the questionnaire. You do not have to give a reason.

How will my privacy be protected?

Any information held on computer or in a database identifying employees will be separated from the data sets and will be destroyed at the end of the data gathering phase of the research in February 2014 and **will never be passed to your company or any third parties**. Following completion of the data gathering phase, contact details will be detached from the questionnaires and shredded.

Questions about the research : If you have questions regarding this study, you may contact me, Claire Pekcan on +44 (0) 7795622910 or email: claire.pekcan@solent.ac.uk

Questions about your rights as research participants: If you have questions you do not feel comfortable asking me, you may contact my supervisor, Professor Neil Conway (Professor of Organizational Psychology at Royal Holloway College, University of London), neil.conway@rhul.ac.uk

Thank you for taking the time to participate in this research.

Examples of Promises Employers make to Employees

Below are three types of promises organisations can make to you for your service or contribution to the organization:

1. Your employer makes a *verbal* promise to you.

Verbal promises may come from any member of your organization acting on your employer's behalf; e.g.

- a fleet manager promises you a promotion after your next contract;
- a shore-side manager promises you that only the best employees will be recruited to work on-board the company's ships;
- the crewing department promises you that you will be relieved in the next port;

2. Your employer makes a *written* promise to you.

Written promises may come from such sources as

- e-mails sent to you by other employees acting on the company's behalf e.g. a training master promising you the next available place on a training course that you want to do;
- mission statements promising certain things such as a no-blame culture;
- company magazines promising job security.

3. Your employer may make subtle or implied commitments to you known as **Implicit promises**; e.g.

- shore-side managers normally give out praise when you handle an emergency on-board quickly and effectively;
- line managers normally offer constructive feedback on your performance at the end of your contract;
- your decisions usually get the backing of your seniors;

Please see the next page for examples of ways in which employers fail to meet their obligations or exceed their obligations to employees...

Instructions for Completing the Diary

Completing the diary involves responding to questions, choosing responses that represent your answer, and a little bit of writing about negative and positive events.

Important: The diary must be completed at the **end of your working day** or **last watch for the day**. I would like you to complete the diary **once a day** for a period of **14 days**.

In the diary, you will be asked for the following information:

1. **In Section 1:** you will be asked the date, time, and location; whether you have been involved in any incidents; and, how you have felt today overall
2. **In Section 2,** you will be asked if you have had any negative events where your employer, or someone acting on their behalf, has fallen short of its obligations to you / gone back on its commitments to you. If you experienced a negative event, you will be asked to describe the event and record how you felt.
3. **In Section 3,** you will be asked if you have experienced a positive event, where your employer, or someone acting on their behalf has gone above and beyond their obligations to you. You will be asked to describe the event and record how you felt
4. **In Section 4,** you will be asked about how you have managed your feelings today, any memory lapses, and what you have done today.

Please complete **Sections 1 and 4 every day** whether or not you experienced any positive or negative events.

Please complete **Sections 2 and 3 only** if you have either a positive or a negative experience.

If you have more than one positive or negative event, just describe the most significant one for you.

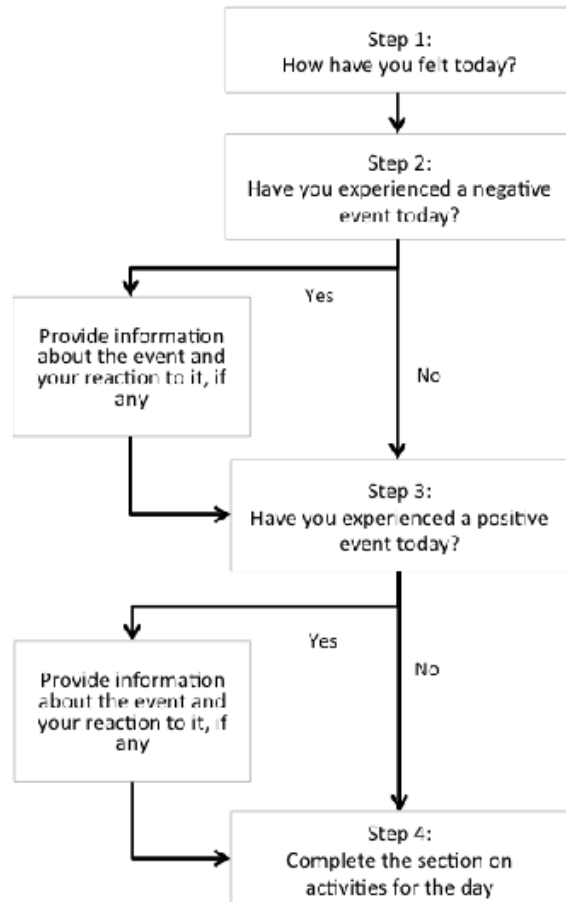
If you have **not** had a positive or a negative event that day, you will only be asked to complete Sections 1 and 4.

On a day when you **don't** experience a positive or negative event, the diary should take you about 5 minutes to fill in.

On a day where you experience a positive and/or negative event, it will take about 15 minutes to fill in.

A flow diagram for completing your daily diary is presented below:

The diary will start on the page after that...



Please complete your security code In order that I can match up your responses with the questionnaire please complete your security code questions. In the first box, please enter in the box below the day of the month that you were born on. I was born on 14 November, so I would enter 14. In the second box, enter the first two letters of the city, town or village in which you were born. I was born in London, so I would enter LO In the last box, enter your height. I'm 163 cm so I would enter 163.

1. Day of the month you were born (1)
2. First 2 letters of the city, town or village you were born in (2)
3. Please enter your height (3)

What is the date (DD/MM/YY)?

What is the time (24 hour clock)?

Where were you today?

- Deep sea (1)
- Coastal waters (2)
- In port (3)
- Other, please specify... (4) _____

Have you had an accident today?

- Yes (1)
- No (2)

Have you been involved in any near misses today?

- Yes (1)
- No (2)

Overall, how have you felt about your employer today? Please state the extent to which you agree with the following statements about how you have felt about your employer and how well it has kept its promises today.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
I felt that my employer kept most of its promises to me today (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel my employer came through in fulfilling its promises to me today (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have not received somethings promised to me in exchange for my contributions (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My employer has broken many of its promises to me even though I've upheld my side of the deal (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt a great deal of anger towards my employer (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt betrayed by my employer (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that my employer violated the contract between us today (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt extremely frustrated by how I have been treated by my employer (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How have you felt today? Listed below are a number of words that describe different feelings and emotions. Please read each word and decide the extent to which each words applies to you. Please think about how you have felt overall at work today.

	Never (1)	Occasionally (2)	Some of the time (3)	Much of the time (4)	Most of the time (5)	All of the time (6)
Gloomy (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Calm (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uneasy (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enthusiastic (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cheerful (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worried (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comfortable (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tense (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depressed (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Optimistic (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relaxed (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Miserable (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the space below, please write in any other emotions you might have felt (e.g. energetic, bored, angry, fatigued) and the extent to which you felt them.

	Never (1)	Occasionally (2)	Some of the time (3)	Much of the time (4)	Most of the time (5)	All of the time (6)
... (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Negative Event

Have you experienced a negative event today where your employer or someone acting on behalf of your employer failed to meet / has fallen short of its commitments or obligations to you? This event can be a communication from someone in your organization, an interaction with someone or an observation of something happening to someone else in your organization. Please see below for examples.

- Yes (1)
- No (2)

Examples of Employers Failing to Meet their Obligations

When an employer fails to meet its obligations, it **reneges or goes back on** what it promised to do or **fails to do** what it was obliged to do in return for your service or contribution to the organization. Below are some possible examples of how employers fail to meet their obligations. These are only examples and you can probably think of many more

- Your employer breaks promises to you about such things as opportunities for promotions, external training courses, pay you were told you would receive, job security, etc.
- A promise to change your roster so that you could make your son's 1st birthday has been broken
- Overtime that was promised to you has not been allowed
- Additional job demands have been made on you that were not part of your agreement with your employer
- Support from your seniors you were promised for making decisions to stop operations when unsafe to continue has not been forthcoming
- You feel you have been exploited by your employer in some way when in the past you have always been treated fairly
- The promise of better quality PPE has not been honoured
- You have voiced a concern over a piece of equipment. Your concerns over equipment have usually been given prompt attention. On this occasion no-one in the organization seems to care
- You have been treated disrespectfully by a co-worker
- Your employer or manager usually makes you feel valued for your efforts, but on this occasion, when you have already put yourself out, s/he does nothing
- Newly-joined staff do not meet promised levels of performance
- Your employer or manager does not behave ethically and encourages you to take risks to meet commercial deadlines
- Your employer or manager expects you to take a decision which carries a higher level of responsibility than you are paid to take
- Your employer or manager expects you to carry out an activity for which you are not trained

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

Section 3 - Negative Event Details How has your employer fallen short of meeting its commitment or obligations to you? Please describe how your employer, or someone acting on their behalf, has fallen short of its commitments or obligations to you. These commitments or obligations may have been made yesterday, last week, last month or even a year ago. The important thing is that you became aware today that the commitment or obligation has not been honoured and this was a negative experience for you. Please refer to the definitions if you are unsure about what a commitment or obligation is or you would like to be reminded of some examples. Click the back button. Remember that a commitment or obligation can be about any aspect of your job. Also, it does not matter whether the other party is aware or not that they have fallen short of their commitments or obligations to you. Please record it anyway. Please describe the negative event that you experienced today and some details about the event...

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

What was the event? Please describe the event in as much details as possible: what happened and why was it negative?

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

How large was the difference between what you previously felt you were owed and what you received today?

- No difference (1)
- A fairly small difference (2)
- A small difference (3)
- A fairly large difference (4)
- A large difference (5)
- A very large difference (6)
- An extremely large difference (7)

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

Who acted in a way that fell below your employer's commitment or obligation to you? (e.g. Director, DPA, Superintendent, Crewing Manager, Agent, Master, Line Manager, Co-worker etc.)

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

How often has this happened to you in the past with this employer?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

How important is this event with respect to your relationship with the other person / your employer?

- Not at all Important (1)
- Very Unimportant (2)
- Neither Important nor Unimportant (3)
- Very Important (4)
- Extremely Important (5)

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

What was your reaction to the event? Listed below are a number of words that describe emotions. Please read each word and decide the extent to which you experienced that emotion following the event. Some of the emotions may not apply. If this is the case, select "Not at all"

	Not at all (1)	A little (2)	To some extent (3)	To quite a large extent (4)	To a great extent (5)	To a very great extent (6)
Outrage (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resentment (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hurt (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anger (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilt (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Embarrassment (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bitterness (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surprised (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

In the space below please write in other emotions you might have felt (e.g. drained, frustrated, disappointed)

	Not at all (1)	A little (2)	To some extent (3)	To quite a large extent (4)	To a great extent (5)	To a very great extent (6)
... (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Have you experienced a negative event today where Yes Is Selected

How many other negative events relating to your relationship with your employer have you had today?

- None (1)
- One (2)
- Two (3)
- Three or more (4)

Positive Events

Have you experienced a positive event today where your employer, or someone acting on their behalf, exceeded its commitments or obligations to you? This event can be a communication from someone in your organization, an interaction with someone or an observation of something happening to someone else in your organization. Please see below for examples.

- Yes (1)
- No (2)

Examples of Employers Exceeding their Obligations

When an employer exceeds its obligations, it *goes above and beyond* what it promised to do or was obliged to do in return for your service or contribution to the organization. Below are some possible examples of how an employer exceeds its obligations. These are only examples and you can probably think of many more.

- You are paid a bonus in error, but your employer acknowledges its mistake and does not ask for the money back
- Your employer pays for you to go on a training course that is not mandatory for your position
- You receive a pay rise above the market rate
- You are offered a promotion ahead of when it was initially promised
- Your employer installs Internet on-board your vessel ahead of the time it was promised
- Your daughter is getting married and you are supposed to be on-board. Your employer finds a relief for you so you can be at your daughter's wedding.
- You have been working long hours on a difficult problem on-board and your manager makes a request to the office to allow the ship to go to anchor for a couple of days to give you rest before the next loading
- You have had a long flight to join your ship; it's 0800 and your ship isn't due to berth until 1400. The office check you into a hotel so that you don't have to wait on the quayside for your ship.
- The agent comes out on a launch to deliver the spares you urgently need despite your late order
- Your employer relieves you earlier than your contract because its an easier port for you to get home from than the one you are due to be relieved in

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

Section 2 - Positive Event Details

How has your employer gone above and beyond its commitment or obligations to you? Please describe how your employer, or someone acting on their behalf, has gone above and beyond its commitments or obligations to you. These commitments or obligations may exist because of promises that have been made yesterday, last week, last month or even a year ago and you have paid for them with your contribution to the organization. The important thing is that you became aware today that the commitment or obligation has been exceeded and this was a positive experience for you. Please refer to the definitions if you are unsure about what a commitment or obligation is or you would like to be reminded of some examples. Remember that a commitment or obligation can be about any aspect of your job. Also, it does not matter whether the other party is aware or not that they have exceeded their commitments or obligations to you. Please record it anyway. Please describe the positive event that you experienced today and some details about the event...

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

What was the event? Please describe the event in as much details as possible: what happened and why it was positive.

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

How large was the difference between what you previously felt you were owed and what you received today?

- No difference (1)
- A fairly small difference (2)
- A small difference (3)
- A fairly large difference (4)
- A large difference (5)
- A very large difference (6)
- An extremely large difference (7)

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

Who went above and beyond your employer's commitment or obligation to you? (e.g. Director, DPA, Superintendent, Crewing Manager, Agent, Master, Line Manager, Co-worker etc.)

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

How often has this happened to you in the past with this employer?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

How important is this event with respect to your relationship with your employer / the other person?

- Not at all Important (1)
- Very Unimportant (2)
- Neither Important nor Unimportant (3)
- Very Important (4)
- Extremely Important (5)

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

What was your reaction to the event? Listed below are a number of words that describe both positive and negative emotions. Please read each word and decide the extent to which you experienced that emotion following the event. Some of the emotions may not apply. If this is the case, select "Not at all"

	Not at all (1)	A little (2)	To some extent (3)	To quite a large extent (4)	To a great extent (5)	To a very great extent (6)
Cared for (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Admiration (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Secure (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Affection (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indebted (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excitement (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respected (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pride (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surprise (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Valued (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

In the space below please write in other emotions you might have felt (e.g. ecstatic, euphoric, pleased)

	Not at all (1)	A little (2)	To some extent (3)	To quite a large extent (4)	To a great extent (5)	To a very great extent (6)
... (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Have you experienced a positive event today where Yes Is Selected

How many other positive events relating to your relationship with employer have you had today?

- None (1)
- One (2)
- Two (3)
- Three or more (4)

How did you manage your feelings and emotions today? Listed below are a number of strategies that people use to manage emotions. Please read each strategy and decide whether or not you used the strategy today to manage your feelings in reaction to today's events.

	Yes (1)	No (2)
Avoided a situation that I know will make me feel bad (1)	<input type="radio"/>	<input type="radio"/>
Tried to solve the problem (2)	<input type="radio"/>	<input type="radio"/>
Removed myself from the situation (3)	<input type="radio"/>	<input type="radio"/>
Kept myself busy working on other things (4)	<input type="radio"/>	<input type="radio"/>
Did something enjoyable to improve my mood (5)	<input type="radio"/>	<input type="radio"/>
Found humour in the situation (6)	<input type="radio"/>	<input type="radio"/>
Thought about how the other person feels (7)	<input type="radio"/>	<input type="radio"/>
Reminded myself that I can't control everything (8)	<input type="radio"/>	<input type="radio"/>
Pretended I am in a good mood (9)	<input type="radio"/>	<input type="radio"/>
Hidden how I really feel (10)	<input type="radio"/>	<input type="radio"/>
Thought about the situation over and over (11)	<input type="radio"/>	<input type="radio"/>
Continued to think about the situation wishing it had gone differently (12)	<input type="radio"/>	<input type="radio"/>
I couldn't stop thinking about how I was feeling (13)	<input type="radio"/>	<input type="radio"/>

Please indicate if the following happened to you at work today:

	Yes (1)	No (2)
Did you forget to do something you said you would? (1)	<input type="radio"/>	<input type="radio"/>
Did you throw away / delete something you meant to keep? (2)	<input type="radio"/>	<input type="radio"/>
Did you forget where you put something? (3)	<input type="radio"/>	<input type="radio"/>
Did you read something only to find you hadn't been thinking about it and had to read it again? (4)	<input type="radio"/>	<input type="radio"/>
Did you have trouble making up your mind? (5)	<input type="radio"/>	<input type="radio"/>
Did you forget why you went from one part of the ship to another? (6)	<input type="radio"/>	<input type="radio"/>
Did you fail to hear someone speaking to you when you were doing something else? (7)	<input type="radio"/>	<input type="radio"/>
Did you say something and then realise afterwards that it might be taken as insulting? (8)	<input type="radio"/>	<input type="radio"/>
Did you lose your temper and regret it? (9)	<input type="radio"/>	<input type="radio"/>

Please indicate the extent to which you did the following at work today: Please use N/A (not applicable) if you weren't required / needed to do the activity described, e.g. for the statement, "I performed work properly while wearing my PPE", you would select N/A if you didn't have a job to do today that involved wearing PPE. Please answer as honestly as possible. There are no right or wrong answers and you will not be judged on the answers you give.

	N/A (1)	Not at all (2)	A little (3)	To some extent (4)	To quite a large extent (5)	To a great extent (6)	To a very great extent (7)
I used the correct PPE for the job (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I performed my work properly while wearing my PPE (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I followed the correct work practices and procedures (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I practised safe spill handling (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I informed personnel responsible for H&S on-board about potential exposure to a hazard (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I reported all incidents, accidents, near-misses and/or illnesses (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I notified workers / supervisors of an emergency condition (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I consulted reference materials for additional H&S guidance information (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate the extent to which you did the following at work today: Please use N/A (not applicable) if you weren't needed to do the activity described, e.g. for the statement, "I assisted others to make sure they performed their work safely", you would select N/A if you didn't have a job to do today that involved assisting others. Please answer as honestly as possible. There are no right or wrong answers and you Please indicate the extent to which you did the following at work today: Please use N/A (not applicable) if you weren't needed to do the activity described, e.g. for the statement, "I assisted others to make sure they performed their work safely", you would select N/A if you didn't have a job to do today that involved assisting others. Please answer as honestly as possible. There are no right or wrong answers and you will not be judged on the answers you give.

	N/A (1)	Not at all (2)	A little (3)	To some extent (4)	To quite a large extent (5)	To a great extent (6)	To a very great extent (7)
I assisted others to make sure they performed their work safely (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I went out of my way to look out for the safety of another crew member (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried to prevent another crew member from being injured on the job (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I raised my safety concerns during a work planning session (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I read up about changes in safety policies and procedures (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I made a suggestion to improve safety on-board (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate the extent to which you found yourself in the following situations today:
 Please answer as honestly as possible. There are no right or wrong answers and you will
 not be judged on the answers you give. I found ...

	Not at all (1)	A little (2)	To some extent (3)	To quite a large extent (4)	To a great extent (5)	To a very great extent (6)
I took a chance to get the job done (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I took short cuts that involved little or no risk (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I followed orders knowing them to be wrong (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This completes your diary entry for Day 1. Thank you for your entry. Your responses
 have been saved. You will be sent a new link tomorrow for your Day 2 diary entry.
