

What You See is What You Do: Imagery and the Moral Judgements of Individuals
with OCD

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Abstract

A key feature of OCD is the occurrence of compulsions that are viewed to ‘prevent some objectively unlikely event, often involving harm’ (ICD 10, F42). In improving our understanding of these compulsions, researchers have begun to explore the moral judgements of individuals with OCD. It has been proposed that these individuals make moral judgements using more deontological, rather than utilitarian, principles (Franklin, McNally & Riemann, 2009; Mancini & Gangemi, 2015). That is, in moral dilemmas, individuals with OCD tend to make judgements based on the morality of actions involved as opposed to the outcome for the greater good. Furthermore, visualising an image has been linked to making deontological judgements, in non-clinical populations (Amit & Greene, 2012). This study investigated moral judgements in OCD and the impact of imagery on these judgements. It was hypothesised that imagery would mediate the association between OCD and moral judgements. One hundred and forty-five participants (including 30 with OCD and 27 in a non-OCD comparison group) were recruited online and completed questions on moral dilemmas that required them to choose between deontological and utilitarian options. The utilitarian option required them to choose to act, causing the deaths of fewer people but saving the lives of many. The deontological option did not involve acting, but resulted in more deaths. A greater presence of OCD symptomatology was associated with making more deontological judgements, when considering some dilemmas. However, when compared by group, individuals with OCD did not make significantly more deontological judgements than individuals in the comparison group. Whilst imagery was found to have a relationship with moral judgements in certain dilemmas, this did not mediate the relationship between OCD and moral

judgements. The results suggest an association between moral reasoning and OCD, not mediated by imagery, and are therefore considered in relation to other theoretical explanations.

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1. Introduction

1.1 Overview

Individuals with Obsessive-Compulsive Disorder (OCD) often worry about harm coming to themselves or others, and feel responsible for preventing it. Models of OCD suggest that the occurrence of an intrusion is a normal phenomenon (Rachman & de Silva, 1978), which acts as a trigger to the awareness of potential harm. In this way, the intrusion triggers a decision as to whether or not to act to prevent the harm (Wroe & Salkovskis, 2000). The Cognitive Behavioural Model of OCD proposes that a heightened sense of responsibility is a key factor in the maintenance of OCD (Salkovskis, 1985; 1989) as it leads the individual to an increased sense of responsibility in response to the occurrence of intrusions, particularly for potential harm. This results in the individual feeling compelled to act to prevent adverse outcomes and contributes to maintaining the cycle of compulsive behaviours (Salkovskis, 1985). Making a decision about acting in response to an intrusion about potential harm requires an individual to make a decision as to what is right or wrong.

A moral judgement is a judgement concerned with right or wrong (Oxford English Minidictionary, Clarendon Press, 1997) therefore a judgement of responsibility for potential harm can be considered a moral judgment (Shaver, 1985 as cited in Pizarro, Ulmann & Bloom, 2003). For example, one person may perceive doing nothing to prevent potential harm as acceptable, whereas another person may perceive that it is acceptable only to do everything they can to prevent it from occurring. In this way, moral judgements contribute towards decision making about actions and, ultimately, the initiation of action (Bandura, 1991).

Researchers have suggested that moral judgements can be influenced by ‘omission bias’ (Ritov & Baron, 1999; Spranca, Minsk and Baron, 1991), which is the phenomena that people generally judge harm that occurs through inaction (failing to act) as more acceptable than harm resulting from action (Ritov & Baron, 1999; Spranca et al., 1991). Omission has been considered a part of responsibility (Wroe & Salkovskis, 2000), and has been demonstrated to influence decision making regarding action or inaction in the face of potential harm. For example, if an individual comes to harm themselves by stepping on broken glass on a path, most people feel that them having seen the broken glass on the path and not removing it would be more acceptable than placing the glass there themselves. Research has begun to help us to understand the role of moral judgements in people with OCD by demonstrating that individuals with OCD judge both these scenarios to be equally unacceptable, in situations that activate their idiosyncratic OCD concerns (Wroe & Salkovskis, 2000).

Research has also begun to propose that individuals with OCD use other reasoning processes to make moral judgements. Franklin, McNally and Riemann (2009) found individuals with OCD to make more decisions based on individual rights and the quality of the action involved, in comparison to people without OCD, who tend to make more decisions based on the greater good and overall outcomes, in moral dilemmas. This is supported by Mancini and Gangemi (2015) who found individuals with OCD to be more motivated to avoid feelings of guilt as a consequence of acting to harm an individual, in comparison to those without OCD.

In nonclinical populations, having an image in mind when making a decision in a moral dilemma has been linked to people making decisions based on the action involved, rather than the overall result (Amit & Greene, 2012). In other words, when

considering acting to end an individual's life for the purpose of saving a group, having an image of the individual supports the judgement that saving the group does not justify ending the life of the individual. It is also known that visual representations are more emotionally salient (Holmes & Mathews, 2005) and emotions are specifically implicated in highlighting moral dilemmas (Horberg, Oveis & Keltner, 2011). As individuals with OCD commonly experience intrusive images it is possible that these affect their moral judgements even more so than in those without OCD.

It would seem that there are differences in the ways that individuals with and without OCD make judgements in moral dilemmas. An enhanced understanding of how individuals with OCD make these judgements, and if imagery is implicated in this process, could help us develop even greater insight into compulsive behaviours associated with OCD and inform the treatments we are able to provide.

This chapter will review the literature in these areas, beginning with a consideration of the prevalence and impact of OCD and followed by a consideration of the implications of responsibility and decision making in the disorder. It will then consider the research on moral judgements and explain how this is relevant to OCD. Finally, it will consider the contributions of imagery and emotion and how this could help us to refine our understanding. The review will conclude with an outline of the present study.

1.2 Obsessive-Compulsive Disorder

The ICD-10 (2016, F42) describes the essential features of OCD to be '*recurrent obsessional thoughts or compulsive acts*'. It describes obsessional thoughts to be '*ideas, images, or impulses that enter the patient's mind again and again*' and notes

that they are '*distressing and the patient often tries, unsuccessfully, to resist them*'. It describes the function of compulsive acts as being to '*prevent some objectively unlikely event, often involving harm to or caused by the patient*'. Finally, it notes that '*If compulsive acts are resisted anxiety gets worse*'. In the short term therefore, these behaviours reduce anxiety levels and act as positive reinforcement. However, in this way, the individual does not experience the outcome resulting from not engaging in compulsive behaviours and evidence does not disconfirm the fear. This leads to the belief that the compulsion is the only way of coping.

Being ranked as the tenth most debilitating illness in the world (WHO, 1999), OCD significantly interferes with people's daily lives (Bobes et al., 2001). It is common for OCD to be comorbid with other mental health conditions as well as substance use disorders (Ruscio, Stein, Chiu & Kessler, 2010) and it is therefore associated with a poorer quality of life (Macy et al., 2013) and increased use of health services (Markarian et al., 2010). As we learn more about OCD, the complexity and diversity of the disorder is becoming clearer. There is evidence to suggest that tailoring treatment to specific presentations may be of benefit (Abramowitz, Franklin Schwartz & Furr, 2003) and it is therefore important to continue to strive for more a more in-depth understanding of the disorder.

1.2.1 Theories of OCD

Behavioural theories. Behavioural theories of OCD (Rachman, 1971) were the first attempt to explain the disorder. Behavioural theory states that obsessive thoughts begin as neutral stimuli that become associated with a feeling of anxiety. The association becomes learned and individuals with OCD use compulsive

behaviours to neutralise the unpleasant feeling. As a result of these behaviours, obsessive thoughts become negatively reinforced and compulsions are strengthened, making them more likely to intrude again in the future. Through this, individuals do not get the opportunity to learn what would happen if they were exposed to the obsessive thought and their fear is maintained.

Behavioural theories contributed to the development of treatment for OCD, which initially involved exposure and response prevention. This consisted of individuals exposing themselves to their fears and preventing themselves from responding with compulsions, breaking the association. Treatments of this type had around a 50% response rate. However, it is now well documented that other factors, such as therapist reassurance and reduced responsibility on behalf of the individual, may have contributed to the reduction in anxiety (Gillihan, Williams, Malcoun, Yadin & Foa, 2013).

Cognitive-behavioural theory. Salkovskis (1985; 1989) later highlighted the importance of cognitive factors, and in particular responsibility beliefs in the cognitive-behavioural (CB) model for OCD (see Figure 1.1). The CB model proposes that intrusions are common (Purdon & Clark, 1993; Rachman & de Silva, 1978) in people with and without OCD but the way in which intrusions are interpreted, for example, with a heightened perceived risk of harm and increased responsibility for the harm (Salkovskis, 1985, 1989; Steketee, Frost & Cohen, 1998) leads to increased anxiety and compulsive behaviours.

Salkovskis, Rachman, Ladouceur and Freeston (1992, cited in Salkovskis, Richards & Forrester, 1995) defined responsibility as *'the belief that one has the*

power that is pivotal to bring about or prevent subjectively crucial negative outcomes. These outcomes may be actual, that is having consequences in the real world, and/or at a moral level' p.285. According to this, if an individual feels as though they have the power to prevent a negative outcome, they will perceive themselves as being responsible for this and feel compelled to take action to prevent it. The CB model (Salkovskis, 1985; 1989) proposes that this solution becomes the problem.

The CB model also highlights the role of counterproductive 'safety behaviours' such as thought suppression and avoidance and attentional biases such as hypervigilance to intrusions in the maintenance of the disorder. In addition, Steketee, Frost, Rheaume and Wilhelm (1998) highlight the implications of overestimation of threat, intolerance of uncertainty, thought-action fusion (TAF) and perfectionism often present in individuals with OCD. Rachman (1997) stated that individuals with OCD often feel their thoughts have more importance and personal significance and this, in combination with less flexibility of thought (Lawrence et al., 2006), makes it more difficult for them to generate alternative explanations for their intrusions. Previously developed beliefs towards responsibility and harm make intrusions more salient and OCD is maintained.

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Figure 1.1 The Cognitive-Behavioural model of OCD from: Salkovskis et al., (2000). Responsibility attitudes and interpretations are characteristic of obsessive compulsive disorder, p.349.

CB models of OCD therefore propose the role of interpretations of intrusions as being key in the way that individuals respond to the awareness of potential risk. As individuals with OCD interpret intrusions with a heightened sense of responsibility and perceived awfulness, this affects the way in which they interpret moral dilemmas and raises the possibility that they make different judgements to individuals without the disorder.

1.2.2 The role of responsibility in OCD. Research has focussed on understanding the key role of responsibility in OCD. Based on clinical experience and theoretical observations, Salkovskis, Shafran, Rachman and Freeston (1999) suggested that early experiences could influence the development of an increased sense of responsibility; explaining the meaning attached to intrusive thoughts in individuals with OCD. These experiences included having increased responsibility as a child, having to act according to strict rules, overprotective parenting, feelings of blame or accidental behaviour causing harm to someone. Salkovskis et al. (1999) suggested that beliefs about responsibility may develop in order to cope with these early experiences, enabling the development of healthy lives but also acting as a risk factor for the development of OCD.

Empirical evidence has supported these theories of responsibility. Ladouceur et al. (1995) induced a perception of heightened responsibility into sixty non-clinical participants by asking them to identify sounds of different lengths, used to support vulnerable people at road crossings. They were told that their errors could lead to harmful outcomes and were provided with fictitious statistics on recent accidents. Participants demonstrated more OCD-like behaviours and more concern about errors than controls however it was unclear whether this was due to responsibility or the

perception of danger. Further supporting the role of responsibility, individuals without OCD have been found to neutralise intrusive thoughts that are rated as strong in terms of responsibility (Freeston, Ladouceur, Gagnon & Thibodeau, 1993). Bouchard, Rheume and Ladouceur (1999) found non-clinical participants who were 'highly perfectionistic' to feel more responsible for negative consequences and suggested perfectionism could predispose individuals to feel more responsible. Although this would have benefitted from replication in individuals with OCD as well as analysing the data using an experimental manipulation in order to make firmer conclusions, the authors suggested these findings were highly relevant to the CB model of OCD.

By analysing CB models and clinical material, Salkovskis (1985) hypothesised that an individual with OCD's general sense of responsibility could influence their interpretations of intrusions. He suggested that if an intrusive thought was combined with a heightened sense of responsibility it was interpreted as having more personal relevance and bringing more harm. Adding yet more support to the role of responsibility in OCD by looking at the empirical effect of removing responsibility, Lopatka and Rachman (1995) lowered the perceived responsibility of 30 participants with OCD, in situations that they would usually feel responsible, by assigning it to the researcher. Whilst not confirming how responsible participants felt after doing so, the authors found both urges to perform compulsions and distress decreased. They suggested a link between responsibility and compulsive behaviours, which could have been strengthened had the authors used a specifically developed and validated measure of responsibility as opposed to a self-report measure. Looking at a similar area, Shafran (1997) found therapist absence induced more discomfort and compulsions when individuals experienced intrusive thoughts and Freeston et al.

(1993) found individuals with OCD to believe more strongly in beliefs related to responsibility than a control group. These findings have not been so pronounced in other anxiety disorders, leading to the conclusion that the role of responsibility is specific to OCD (Foa, Amir, Bogert, Molnar & Przeworski, 2001).

1.2.3 Decision making in OCD. In combination with heightened sense of responsibility and associated responsibility related interpretations, the occurrence of intrusions about potential harm raises awareness to harm and requires a decision as to whether or not to act to prevent it (Wroe & Salkovskis, 2000). Whilst compulsive behaviours often seem automatic to individuals with OCD, these decisions are influenced by responsibility related intrusions that, nevertheless, require a determination of what feels to be the right course of action. It could then be assumed that this decision requires an analysis of right and wrong, in turn making it a moral judgement. In support of this, researchers have looked at moral judgements in people with and without OCD, and this has supported refinements in the understanding of decision-making in OCD.

There is evidence to suggest that the decision-making process may differ in individuals with OCD, particularly as they focus more on perceived risks. Researchers have looked specifically at the role of factors that influence decisions in situations that trigger awareness of potential harm. Wroe and Salkovskis (2000) studied participants' decisions about whether to act to prevent harm from occurring, in response to hypothetical moral dilemmas. They proposed that the occurrence of an intrusion raises an individual's awareness to potential risks in a given situation such that the individual must then make a decision as to whether or not to act to prevent that harm. It was demonstrated that responsibility assumptions, such as 'If I don't act when I can

foresee danger, then I am to blame for any consequences' (p. 1142), play a particularly important role in the maintenance of OCD by leading the person to decide to act to prevent possible harm (Salkovskis et al., 2000). The research concluded that decision-making abilities are not different between people with and without OCD per se, but that the factors used to make decisions are influenced by responsibility interpretations, thus leading to a difference in decision outcomes. In support of this, when compared to non-clinical individuals, individuals with OCD have been shown to have increased levels of activity in the ventromedial prefrontal cortex (Baxter et al., 1988), an area essential for decision making (Damasio, 1994), when making decisions. They have also been shown to use less psychological flexibility in decision making (Lawrence et al., 2006), adding weight to the argument that it is decision making processes that may differ between individuals with and without OCD, as opposed to their decision making abilities per se (Neilen, Veltman, de Jong, Mulder & den Boer, 2002). Deciding whether or not to act to prevent harm implies an assessment of what the correct thing is to do and differences in decision making processes suggest that individuals with OCD might make these moral judgements in a different way to those without OCD. In understanding the decision making process, it can be useful therefore to consider the literature on moral judgements.

1.3 Moral Judgements

1.3.1 Moral judgements in the general population. Individuals often spend time thinking about the behaviour of others and whether their actions are right or wrong (Boehm, 1999 as cited in Haidt, 2001). These judgements are guided by moral values formed in early life (Darley, 1993) and shaped through experience (Turiel, Killen & Helwig, 1987). Moral judgements can also be influenced by personality

traits such as agreeableness, perfectionism (Yang, Steober & Wang, 2015) and conscientiousness, which have been shown to be important in shaping decisions in line with societal moral norms (Walker, 1999). Consistent with these findings, individuals low in these personality traits have been found to engage more in behaviours deemed to be morally unacceptable (Karim, Zamzuri & Nor, 2009). Furthermore, emotional arousal and positive affect have been shown to aid the identification of moral dilemmas and their resolution in line with the individual's morals, by engaging 'more sophisticated moral structures' (Gaudine & Thorne, 2001).

The way in which people make moral judgements has been an important topic of study for several decades (Thomson, 1985). One dilemma referred to in the literature known as 'the trolley dilemma', is often used to consider moral judgements. In this scenario, a fast moving trolley is due to hit and kill five people if it carries on moving along its tracks. The only way to save the five people is to switch a switch, which changes the direction of the trolley, onto an alternative track. However, if the trolley switches to this alternative route, it will hit and kill one person. The individual is asked to consider which option is more acceptable, or which option they may choose.

'The footbridge dilemma' (Thomson, 1985) outlines another commonly cited dilemma. In this case, a fast moving trolley is due to hit and kill five people. The people can be saved if another individual is pushed from a footbridge onto the trolley. This would stop the trolley from killing five people, but would kill the person pushed. When asked whether an action is morally acceptable or not, for example, whether it is acceptable to push the individual from the footbridge, or to switch the switch and kill one person instead of five, there seem to be differences in people's answers

(Thomson, 1985). In the trolley dilemma, most people think it is acceptable to kill one person to save the lives of five. However in the footbridge dilemma, most people think it's unacceptable to push and kill the person, in order to save the lives of five. Research has aimed to better understand these differences and understand why it seems acceptable to kill a person in one dilemma, but not the other.

The dilemma people often face is in being asked to make a decision between favouring the rights of the individual (i.e., the individual being pushed) and the benefit of the 'greater good' (i.e., the five people). One suggestion, which attempts to explain the differences in answers across scenarios, is that the footbridge dilemma engages people's emotions, in a way that the trolley dilemma does not (Greene, Sommerville, Nystrom, Darley & Cohen, 2001). It is suggested that the thought of pushing someone to his or her death induces more emotion than the thought of switching a switch. This suggests that some moral dilemmas engage emotional processing to a greater extent than others, and this affects moral judgements.

Another explanation for the findings of the trolley dilemma is that the ratio of 5:1 is influential in people's decision. Gangemi and Mancini (2013) changed this ratio to 5:3 and found the percentage of people making decisions in favour of the individual changed to 50% (Gangemi, personal communication, September 21, 2015). In order to understand these different explanations, it can be helpful to consider the ways in which these judgements are made in more detail.

Moral judgements have historically been thought to occur outside of consciousness and be emotionally driven (Freud, 1976). Empirical data shows humans to make judgements in milliseconds, even before giving the decision

conscious thought (Willis & Todorov, 2006). Furthermore, Hume (1960) proposed that moral judgements are largely influenced by ‘gut feelings’ as research showed individuals to have an automatic feeling of approval or disapproval when making a moral judgement. Albeit only in ‘hypnotisable’ participants, Wheatley and Haidt (2005) furthered this by inducing feelings of disgust and found this lead to more judgements of an action in a moral dilemma being morally wrong, supporting the suggestion that moral judgements are closely linked with emotion. Neuroimaging evidence further confirmed this by showing brain regions associated with emotion to be activated whilst nine individuals made moral judgements (Greene et al., 2001).

Others, however, have contrasting views stating that individuals are aware of making moral judgements, and that they use explicit reasoning for this (Kohlberg, 1969; Piaget, 1932). In support of this, cognitive effort (Kohlberg, 1984) and intellectual ability (Moore, Clark & Kane, 2008) have been found to be key components of moral judgements. Kohlberg stated that moral judgements are developed through an explicit learning process; for example, taking on different roles and attempting to understand dilemmas from different points of view. Of note, is that it is not clear whether the role of emotion was also considered in this research.

This diverging evidence highlights a tension in the research. Whether to do with emotional salience or explicit reasoning, people have been seen to vary in their inclination to make judgements in the favour of individual rights or in favour of the greater good (Greene et al., 2001). In the literature, these types of decisions are termed deontological and utilitarian judgements respectively (Amit & Greene, 2012).

A deontological judgement is a decision based on the morality of an action, where the quality of the action is more important than the consequences. A deontological decision would be the ‘right’ thing to do, even if that produced more harm than doing the ‘wrong’ thing. For example, it would be wrong to lie, in order to save a friend from a murderer. People who make deontological decisions judge that moral values should not be broken, whatever the reason (Kant, 1785 as cited in Szekely & Miu, 2015), and that individual rights should be key in making decisions (Kant, 1785).

In opposition, a utilitarian decision is one that benefits the greater good (Mill, 1998). To an individual making a utilitarian decision, morality is decided by the good in an action’s outcome; thus killing a person is acceptable, if multiple others are saved (Mill, 1998). Utilitarian judgements are also referred to in the literature as ‘altruistic’ (Mancini & Gangemi, 2011) or ‘consequentialist’ (Cushman & Greene, 2012) judgements.

The dual process model (Greene et al., 2004) helps to understand the different parts of the literature and the conflicts between emotion and reason, deontology and utilitarianism. This model proposes that moral judgements require psychological systems involving both emotion and explicit reasoning. In this model, reasoning relies on two separate brain systems, with deontological moral judgements being ‘driven by automatic emotional processes’ in the ventromedial prefrontal cortex (VMPC), an area specific to moral judgements (Greene & Haidt, 2002) and social emotion (Damasio, Tranel & Damasio, 1990), and utilitarian moral judgements being ‘driven by controlled cognitive processes’, in the dorsolateral prefrontal cortex (DPC). In line with this, it has been shown that emotions are important in raising an individual’s

awareness of moral dilemmas and help to make decisions in moral dilemmas (Horberg et al., 2011).

In line with Freud's (1976) early work, Greene et al.'s (2001) experimental study concluded that there are variations in the engagement of emotion in moral judgements and that these differences have a strong influence on moral judgements. The authors found more emotion to be involved in personal moral dilemmas and this led to more deontological judgements. This was based on the responses of nine participants responding to 60 dilemmas whilst being monitored by fMRI. This correlational study was supported by further empirical studies showing a causal relationship that a reduction in emotion lead to individuals making fewer deontological judgements, in moral dilemmas (Bechara, Tranel, Damasio & Damasio, 1996; Koenigs et al., 2007). Whilst only based on six participants making decisions on 50 dilemmas, Koenigs et al. (2007) found that those with damage to the VMPC, which would imply a level of deterioration in emotional functioning, made fewer deontological judgements. The same results have been found in individuals with fronto-temporal dementia, who also often have fewer emotional experiences (Bechara et al., 1996). In fact, these individuals have been found to make more utilitarian judgements (Mendez, Anderson & Shapira, 2005), which is in support of the dual process model. Whilst encouraging evidence, it should be noted that it was not made clear whether damage to the VMPC could also have implications on other cognitive abilities of these individuals. This raises the possibility of other deficits being implicated and limits the generalisability of these results.

The dorsolateral prefrontal cortex (DPC) has also been found to play a key role in decision-making in moral dilemmas (Greene & Haidt, 2002) and the theory

that cognitive processes in the DPC drives utilitarian moral judgements has been supported by neuroimaging studies. Greene et al. (2004) suggested an association between cognitive processes and utilitarian judgements, with more cognitive processes being associated with making more utilitarian judgements. Conversely, whilst it may have been expected that adding a cognitive task might prevent utilitarian judgements (Greene, Morelli, Lowenberg, Nystrom & Cohen, 2008), asking individuals to do a cognitive task whilst making a moral judgement has been found to slow down the speed at which utilitarian judgements can be made, whilst deontological judgements are not affected (Greene et al., 2008). This suggested a causal role for cognitive processes and provided further empirical support for the idea that utilitarian judgements require more cognitive engagement than deontological judgements. In other words, utilitarian judgements are more rational and less emotional than deontological ones.

Specifically, Greene et al. (2008) argue that utilitarian judgements are more complex, involving both utilitarian and deontological elements. They suggested that moral dilemmas initially engage both emotional responses and controlled cognition but that utilitarian judgements involve more reasoning and the consideration of moral values. If an individual realises that an automatic emotional response transgresses moral norms, the need for cognitive control is highlighted and executive functions are employed (Greene et al., 2008). This is also supported by Manfrinati, Lotto, Sarlo, Palomba and Rumiati (2013) who presented participants with both deontological and utilitarian options to a moral dilemma and asked them to report on their emotional experiences whilst making their judgement. They found emotion to be involved in both deontological and utilitarian judgements.

It therefore seems possible that individual differences in using emotion or controlled cognition when making moral judgements contributes towards predicting the use of deontological/utilitarian reasoning. However we do not yet know whether or how this affects individuals who have differences in their emotional or cognitive processes, such as those with psychological disorders.

1.3.2 Moral judgements in OCD. As previously stated, a judgement of responsibility for potential harm can be considered a moral judgment (Shaver, 1985 as cited in Pizarro, Ulmann & Bloom, 2003). Individuals with OCD have been shown to have higher senses of responsibility, and react to perceived issues of responsibility more readily than individuals without OCD. This raises the possibility that individuals with OCD may make moral judgements in a way that is different to those without OCD.

Historically, individuals with OCD have been described as having a strong superego (Freud, 1926), referring to the ethical component of the mind that provides moral standards. Furthermore, the intrusive thoughts, doubts and images individuals with OCD experience are often ego-dystonic, that is, conflicting with their values and identity. When considering personality traits, research suggests that individuals with OCD have higher levels of perfectionism (Frost & Steketee, 1997), sensitivity to punishment and neuroticism (Fullana et al., 2004) and these characteristics raise the possibility of these individuals making moral judgements that are different to individuals without OCD, who do not score so highly in these areas. Indeed, past research has often linked issues of morality to OCD. For example, Salkovskis (1989) suggested that individuals with OCD tend to be more sensitive to intrusions that contradict their moral beliefs; Bhar (2004 cited in Doron & Kyrios, 2005) found

individuals with OCD to hold more uncertain views about themselves, in regards to their morals, and Clark and Purdon (1993) suggested that vulnerable individuals might believe that their intrusive thoughts show elements of a 'bad person'. More specifically, using self-report measures, higher levels of OCD symptomatology have been shown to be associated with a heightened awareness of moral dilemmas (Doron, Moulding, Kyrios & Nedeljkovic, 2008) and Abramowitz, Doron, Sar-El and Altenburger (2013) found that the intrusive thoughts of individuals with OCD were related to moral themes.

Rachman (1997) emphasised that individuals with OCD often interpret their intrusions as having a significant personal meaning and having strong implications on their actions. In support of this is thought-action fusion (TAF), a cognitive bias commonly occurring in OCD (Shafran, Thordarson & Rachman, 1996) and known to increase distress and compulsive behaviours (Rachman, 1998). TAF results in individuals with OCD feeling that having an immoral thought is just as bad as acting in line with the immoral thought. Perhaps due to this, in comparison to those with other psychological disorders, individuals with OCD are less likely to see themselves as morally acceptable (Ferrier & Brewin, 2005) and this may go some way to explaining the link between OCD and individuals with OCD feeling additionally responsible for what they do.

In spite of this research, the current understanding of the moral judgements of individuals with OCD is in relative infancy (Franklin et al., 2009) and there is little empirical research looking specifically at this area (Franklin et al., 2009), beyond the role of responsibility. Franklin et al. (2009) suggested that the heightened sense of responsibility associated with OCD might influence moral judgements. Whilst it was

not possible to determine causality from this study, they hypothesised that a heightened sense of responsibility would either be associated with the likelihood of individuals not acting to prevent harm and therefore preferring to permit the deaths of more people (deontological) or that it would be associated with individuals acting to harm and therefore saving the lives of many (utilitarian).

Franklin et al. (2009) studied whether individuals with OCD, in comparison to those without OCD, tended to reason more by using deontological or utilitarian principles, when presented with moral dilemmas in the form of vignettes based on those used by Greene and Haidt (2002) and Greene et al. (2004). Each dilemma involved two options which participants were asked to choose from: acting according to the utilitarian principle of saving as many people as possible, but sacrificing a smaller number (utilitarian judgement) versus not choosing to sacrifice, even a small number, and permitting more deaths to occur (deontological judgement). They found both an increased sense of responsibility and increased OCD symptomatology to be associated with deontological judgements. Therefore, the stronger the sense of responsibility, the less likely participants were to choose to act to kill one person in order to save the lives of others. However, the findings did not show a difference in the number of deontological judgements made by the OCD group, in comparison to the non-clinical group. Higher Y-BOCS scores were associated with more deontological judgements, but again this effect was not statistically significant.

Whilst this result showed no significant differences between the decision-making processes of individuals with OCD, in comparison to those without OCD, it is possible that methodological limitations may account for this. Firstly, their sample was small (N=20 and N=18 in the OCD group and non-clinical groups respectively),

increasing the possibility of insufficient power and the chance of type II error. Secondly, they did not use OCD relevant vignettes. Wroe and Salkovskis (2000) showed that the moral judgements of individuals with OCD only differ from non-clinical controls, in situations that activate their OCD concerns. This is important due to personally relevant situations being more associated to emotional responses (Greene et al., 2001) and deontological judgements (Koenigs et al., 2007). It is therefore possible that these individuals would make more deontological moral judgements in situations activating their OCD concerns. Thirdly, Franklin et al.'s vignettes detailed high-risk dilemmas. It is possible that extreme situations would elicit the same reaction in any individual and those with OCD are able to override their cognitive biases in extreme scenarios (Franklin et al., 2009). This suggestion was supported by Foa et al. (2003) who found no difference between individuals with OCD and those without in regards to the time taken to make a decision in a scenario that was more extreme, but those with OCD took significantly longer to make decisions when the risk was removed. Finally, it is possible that the decisions individuals make for imaginary scenarios differ from those they would make in real life decisions. Although the dilemmas were artificial, neurological imaging research shows that making judgements in hypothetical moral dilemmas, where the utilitarian option involves choosing to harm an individual to save the lives of multiple others, activates brain areas essential for emotional decision making (Greene et al., 2004).

Spranca et al. (1991) found that non-clinical populations report themselves as feeling less responsible when they have not done anything (omission), as opposed to when they have acted and their actions have caused harm. The authors attributed this omission bias to perceived differences in the cause of harm, levels of responsibility

for this and the ‘bald fact that one situation is commission and one is omission’ (p.94). However, specific situations seem to cause individuals with OCD to react similarly for both omission and commission scenarios, showing the sensitivity they have to omissions. Wroe and Salkovskis (2000) proposed that this was due to the ‘obsessional thinking’ of individuals with OCD, specifically their intrusions and responsibility assumptions.

Wroe and Salkovskis (2000) investigated biases in OCD, looking at the action principle, which states that harm resulting from action is less acceptable than harm resulting from inaction (Baron & Ritov, 1999). Although still using self-report of feelings about action, rather than self-report of action or making direct behavioural observations, they presented vignettes depicting dilemmas and compared the responses of individuals with OCD (N=42), other anxiety disorders (N=25) and non-clinical groups (N=52). In contrast to other groups, the individuals with OCD applied the principle differently, judging action and inaction as equally bad, in situations that activated their OCD concerns. This showed that there was no difference in moral judgements per se, rather a difference when OCD concerns are activated. Wroe and Salkovskis (2000) hypothesised that heightened sense of responsibility moderated the relationship between intrusive thoughts and moral judgements, in turn driving compulsive behaviours. This has not yet been tested but it is possible that it is linked to the significance of personal relevance. This evidence heightens the possibility that there may be differences between the ways in which individuals with and without OCD make moral judgements, in certain scenarios, and raises the possibility that this may be related to differences in deontological versus utilitarian reasoning.

Looking at this in more detail, Mancini (2001; cited in Mancini & Gangemi,

2004) suggested that compulsive behaviours are triggered by a fear of not acting in a way that is deemed to be morally correct. In other words, it would not be correct to not try to prevent a feared event from happening. In non-clinical participants, Gangemi and Mancini (2013) found individuals who chose not to act in a moral dilemma tended to use the feeling of deontological guilt as a justification; for example, saying 'who am I to decide who lives and who dies?!'. In contrast, those who chose to act tended to justify it with the altruistic consequences; for example, saying 'it is better than one person dies instead of five' (p. 2975). Mancini, D'Olimpio and Cieri (2004) proposed that Salkovskis and Forrester's (2002) work needed refinement and suggested that a responsible person is not one who thinks their behaviours may cause harm, but one who takes responsibility for them. In agreement with this, Dettore (2003; cited in Mancini & Gangemi, 2011) found that individuals with OCD are less concerned about other people, or their wellbeing, but feel highly responsible for their own actions and the consequences of these.

Refining their theory, Mancini (2008 cited in Gangemi & Mancini, 2011) proposed the existence of two different types of guilt a) altruistic guilt that drives individuals to make decisions for the best outcome for others and b) deontological guilt that drives individuals to make decisions on the basis of their own moral norms, such as 'you shouldn't kill an innocent baby'. In support of their distinction, these types of guilt appear to be associated with different areas of the brain: altruistic guilt involves the insulae and the anterior cingulate cortex, and deontological guilt involves the medial prefrontal areas (Basile et al., 2011).

Mancini and Gangemi (2015) studied the moral judgements of 60 individuals (20 OCD; 20 anxious controls and 20 non-clinical) using seven scenarios detailing

moral dilemmas, similar to those used in Greene et al. (2004), that required participants to choose from deontological or utilitarian outcomes. They found individuals with OCD to be less likely to choose to act, in order to prevent harm to an individual, driven by deontological guilt (they do nothing because it is wrong to kill someone). This finding was greater in individuals with OCD than anxious controls and individuals without anxiety. In support of this, deontological guilt has been shown to activate doubting, discomfort, checking and washing behaviours to a greater extent than altruistic guilt and deontological guilt has been shown to play a role in the development and maintenance of OCD (D'Olimpio & Mancini, 2014). It should be noted however that much of Mancini's team's work so far has also been limited to small populations in specific regions in Italy that are strongly catholic and they highlight how guilt is used as a motivator in education systems there (D'Olimpio & Mancini, 2014). It is therefore possible that their participants were more sensitive to guilt and studies would benefit from replication in other populations to aid generalisation. It should also be noted that, similarly to the research of Franklin et al. (2009) and Greene et al. (2001; 2004; 2008) the scenarios studied always involved omission bias (to act or do nothing). In fact, some authors describe it to have become 'systematised' into deontological theory (Greene & Baron, 2001).

Nevertheless, this provides further evidence for the fact that individuals with OCD may make moral judgements in a different way to individuals without OCD. Specifically, it suggests that those with OCD are especially concerned about the possibility of transgressing a moral norm. It also highlights the importance of the role of emotion in moral judgements.

1.4 The role of emotion

Emotions can be seen as ‘response systems’ that are made up of expression, physiological changes and subjective feelings (Watson & Clark, 1994). They are a common part of human nature because the world is full of new events for us to interpret (Mandler, 1979). Emotion is known to interfere with rationality (Mandler, 1979) and this may be in part attributed to the fact that it is personal in nature, triggered in response to personal appraisals (Horberg, Oveis & Keltner, 2011).

1.4.1 The role of emotion in moral judgements. Emotions are important in helping individuals to interact with their environments (Carni, Petrocchi, Del Miglie, Mancini & Couyoumdjian, 2013). In particular, they can help draw attention to pertinent issues, particularly discrepancies (Dewey, 1894), and make sense of social interaction (Damasio, 1994). Following this, emotion can be key in initiating appropriate action (Carni et al., 2013).

It has been argued that emotions are specifically implicated in highlighting moral dilemmas (Horberg et al., 2011). For example, these authors draw attention to research showing ‘gut feelings’ to support us decide whether or not to help someone (Batson & Shaw, 1991), decide on appropriate punishments for doing something morally wrong (Graham, Weiner & Zucker, 1997) and how to allocate resources between people (Batson, Klein, Highberger & Shaw, 1995). More specifically, different emotions can be implicated in different moral dilemmas. For example, Horberg et al. (2011) also highlighted that moral issues relating to impurity have been found to be associated with feelings of disgust (Haidt & Graham, 2007), issues with fairness have been linked to feelings of anger (Horberg, Oveis, Keltner & Cohen,

2009), and lack of respect for duties has been linked to feelings of worthlessness (Rozin, Lowery, Imada & Haidt, 1999). Furthermore, guilt has been found to be associated with acting in ways that are not in line with one's moral values (Baumeister, Stillwell & Heatherton, 1994). As a result of this, emotions have been proposed to be the mechanism by which moral dilemmas are raised (Horberg et al., 2011) and appraisals are activated, determining the impact emotion has on moral judgements.

Indeed, Greene et al. (2001) suggested that heightened emotion is important in influencing people's moral judgements. As noted above, they found different moral dilemmas to induce emotional processing to a greater or lesser extent and this had an impact on the judgements that people made. Whilst it would benefit from replication in larger samples, their work supports the role of emotion in morality in showing that emotional processes were predominantly activated when individuals made judgements about personal moral scenarios. Other empirical studies with larger samples (N=108) have also found significant emotional reactions as a result of being presented with the possibility of harming others (Cushman, Gray, Gaffey & Mendes, 2012).

Emotion has also been found to influence the type of judgements people make. Szekely and Miu (2015) found negative emotion to initiate moral disapproval and result in more deontological judgements. This is in support of Tassy et al. (2012) who found a relationship between the level of emotion individuals experienced and the chances of them making deontological moral judgements, with more emotion being associated with more deontological moral judgements. It is important to bear in mind that it is not clear whether these emotions were associated with deontological

decisions because participants wanted to avoid choosing the opposite course of action (Mellers & McGraw, 2001), which happened to be utilitarian, or whether deontological and utilitarian options are opposite ends of a continuum (Conway & Gawronski, 2013); despite research in the area assuming that the latter is the case.

1.4.2 Moral emotions in OCD. Amongst the literature on the association between emotion and moral judgements, certain emotions have been labelled as ‘moral emotions’. One such emotion is disgust (Miller, 1997 as cited in Basile et al., 2011) with evidence suggesting that more disgust correlates with increased sensitivity to moral dilemmas and more discomfort when hearing about moral transgressions (Jones & Fitness, 2008). In recent years, interest has been growing in the role of emotion in psychological disorders (Edwards, Jackson & Pattison, 2002) and disgust has been implicated as a specific emotion in OCD, with OCD symptomatology, particularly contamination fears, being associated with increased feelings of the emotion (Olatunji, Ebesutani & David, 2011), even when anxiety (Mancini, Gragnani & D’Olimpio, 2001) and low mood (Olatunji et al., 2007) is accounted for. This finding has been further supported by neuroimaging studies, which clearly showed specific brain regions to be involved in the processing of disgust, and Husted, Shapiria and Goodman (2006) suggested that it may be relevant to contamination-based OCD. It is possible that individuals with OCD find disgust more difficult to tolerate than individuals without OCD due to heightened sensitivity to the emotion (Olatunji, 2010).

If disgust is associated with increased sensitivity to moral dilemmas and is elevated in those with OCD then it is possible that this contributes to the way in which individuals with OCD make moral judgements. Basile, Mancini, Macaluso,

Caltagirone and Bozzali (2013) studied disgust in some detail and described it as having a basic component of guilt, helping to clarify the relationship between these emotions. This is supported by literature suggesting disgust to be a primary emotion (Griffiths, 2003) and guilt to be a more complex emotion (Ekman, 1999) and the finding that the two emotions activate the same brain region (D'Olimpio & Mancini, 2014). This helps to understand Haidt and Hersh's (2001) finding, that individuals commonly experience guilt, after transgressing moral rules. Indeed, guilt has also been linked to the development of moral values (Eisenberg, 2000) and Haidt (2003) proposed that it could activate strong feelings of morality.

Lopatka and Rachman (1995) further proposed a link between guilt and responsibility and this begins to highlight the breath of processes involved in moral judgements, specifically the links between disgust, guilt and responsibility and the role of these emotions in OCD. Guilt has also been specifically linked to symptoms of OCD (Freeston et al., 1993) and Mancini, Gangemi, Perdighe and Marini (2008) further specified that the link between responsibility and guilt is due to concern around having violated a moral norm. Supporting this, D'Olimpio and Mancini showed the induction of deontological guilt (i.e., feeling guilty as a result of transgressing a moral norm) to have similar effects to the induction of responsibility in individuals with OCD, leading to an increase in compulsive behaviours.

It seems therefore that emotion, in particular guilt/disgust, and responsibility may be strongly implicated in the way in which individuals with OCD make moral judgements, and that this is different from the way in which individuals without OCD make their judgements. Furthermore, it is possible that the effects of these emotions may be even stronger when participants are involved in moral actions, rather than

making a more removed hypothetical judgement of moral acceptability. Not only has recent interest been growing in the role of emotion in psychological disorders, but imagery has also become a focus of interest. In fact, Holmes and Mathews (2005) highlight the strong link between these two areas, showing emotional salience to increase with the presence of imagery.

1.5 Imagery

Mental imagery is defined as the voluntary or involuntary ‘simulation or re-creation of perceptual experience across sensory modalities’ (Kosslyn, Ganis & Thompson, 2001 cited in Pearson Naselaris, Holmes & Kosslyn, 2015; p3). Imagery has been a key factor in research on the brain over many years (Pearson et al., 2015) and is claimed to be one of the most important psychological factors supporting memory, planning and decision-making (Pearson et al., 2015). Furthermore, mental imagery is a significant factor in the presentation of many mental health disorders and has an increasingly important role in their treatment (Pearson et al., 2015).

1.5.1 Imagery and moral judgements. Of crucial significance, the presence of imagery has been shown to be associated with individuals making deontological moral judgements (Amit & Greene, 2012). Amit and Greene (2012) hypothesised that deontological moral judgements are supported by visual imagery and that verbal processes support utilitarian judgements. This was based on the finding that visual representations are more emotionally salient (Holmes & Mathews, 2005), than verbal thought (Mathews, Ridgeway & Holmes, 2013), due to the earlier evolution of emotion (O’ hman & Mineka, 2001).

Using a visual/verbal task to assess the preferential cognitive style of their participants (N=51), they found that individuals with visual cognitive styles made more deontological than utilitarian moral judgements. This occurred when they were asked to comment on what they would do in seven moral dilemmas, presented in the form of vignettes. Using another experiment to investigate the mechanism of this effect and asking participants to make self-reports on the contents of their visual imagery, Amit and Greene (2012) explained that this was because participants (N=370) visualised the action rather than the overall outcome. The visualisation also triggered the emotional responses that support deontological judgements.

In order to explain this further, Amit and Greene (2012) drew on construal level theory (Trope & Liberman, 2010) which states that individuals' visual representations can occur on different levels. The theory explains high-level construals to be abstract, representing the overall outcome and low-level construals to be more explicit, showing the ways in which the overall goals are attained. Amit, Algom, Trope and Liberman (2009) found that visual representations facilitate low-level construals and verbal representations facilitate high level construals, so high-level construals can be seen to have similar qualities to utilitarian judgements and low-level construals can be seen to have similar qualities to deontological judgements. These findings suggest a link between the dual-process theory (Greene et al., 2001) and construal level theory (Amit & Greene, 2012) and implicates the role of visual imagery in moral judgements.

Related to this, mental imagery has been found to play a pivotal role in many mental health conditions and their treatments. Intrusive mental imagery causes distress across a range of psychological disorders from anxiety disorders such as post-

traumatic stress disorder and phobias to schizophrenia and personality disorders (Holmes & Matthews, 2010) however, it is only recently that research has begun to look at the effect of images on emotion.

In 2005, Holmes and Matthews found that mental imagery led to more intense emotion than verbal processing. They gave participants scenarios with directions that lead to either mental imagery or verbal processing and found that those in the mental imagery group experienced a greater increase in anxiety than the verbal processing group. Intense emotion was also found as a result of scenarios that were both negative and positive in nature (Holmes, Mathews, Dalgleish & Mackintosh, 2006). This set of research studies was in support of Arntz, de Groot and Kindt (2005), who found emotional memories to have more sensory features than memories that did not evoke such strong emotion. Both findings support the work of Amit and Greene (2012).

Some other properties of imagery also have important implications for this work. Many individuals describe their mental imagery as feeling real, in spite of the knowledge that this is not the case (Pearson et al., 2015). This is especially true when compared with verbal thoughts and imagery has been found to have more of an impact on the actions of individuals (Holmes & Matthews, 2010; Pearson et al., 2015). Given that individuals with OCD often experience distressing images (De Silva, 1986), and at a greater frequency in OCD than in other anxiety disorders (Lipton, Brewin, Linke & Halperin, 2010) it is possible that this effect found by Amit and Greene (2012) may be amplified in these populations.

As Amit and Greene (2012) found individuals to imagine the potential harm caused by an action more when making deontological judgements, it is possible that

imagery mediates the relationship between OCD and deontological judgements, adding an alternative theory to that of responsibility in the triggering of compulsive behaviours and maintenance of OCD. This possibility is supported by Caruso and Gino (2011), who found that closing ones eyes can affect moral judgements. They explained that the increased imagination of the scenario as well as the increased levels of emotion felt when closing one's eyes could affect judgements made. They highlighted the possibility that closing one's eyes may just enable individuals to focus more (Caruso & Gino, 2011), as opposed to having an effect on the vividness of the image but, in light of other evidence, this seems unlikely.

Individuals with OCD experience more visual images than those without OCD. Those relevant to their OCD concerns may produce strong emotional reactions. This coupled with the image of harm and potential difficulties in cognitive control (Whitton, Henry & Grisham, 2014) means that individuals with OCD may find it difficult to control strong emotions, engage in more logical thinking and focus on the more abstract and distant outcome overall.

1.6 Summary

Individuals with OCD are a heterogeneous group and the complexities of the mechanisms causing compulsive behaviours are in the process of being further understood. Research has demonstrated that individuals with OCD often have heightened levels of responsibility (Salkovskis et al., 2000), and this can lead to them engaging in compulsive behaviours, designed to prevent harm from occurring. Research also suggests that individuals with OCD, interpret moral dilemmas differently from those without OCD, feeling that not acting and causing harm is as

bad as acting and causing harm, in situations relevant to their idiosyncratic OCD concerns. Individuals with OCD also use other types of reasoning to make moral judgements. For example, research has shown people with OCD to make more decisions based on individual rights, rather than the greater good (Franklin et al., 2009; Mancini & Gangemi, 2015).

Having an image in mind leads to differences in the use of controlled cognition or emotional processing in decision making in moral dilemmas and this in turn leads to different judgements being made (Amit & Greene, 2012). It is unclear whether this is also the case for individuals with OCD, who have differences in their cognitive and emotional processing. Individuals with OCD are often concerned about transgressing moral norms (Mancini, 2001 cited in Mancini & Gangemi, 2004) and experience frequent and distressing intrusive images, which may produce strong emotional reactions when particularly relevant to them. This raises the possibility that individuals with OCD may also engage in different processes when making moral judgements, specifically being more influenced by imagery and emotional processing.

1.7 The Present Study

1.7.1 Aims. This study aimed to investigate the moral judgements individuals with OCD make and the mechanisms leading to these judgements. Specifically, the study aimed to investigate the possible association between symptoms of OCD and deontological moral judgements and explore whether individuals with OCD make more deontological judgements than individuals without the disorder. It also aimed to explore the impact of the presence of imagery on these judgements.

1.7.2 Hypotheses.

Hypothesis One. OCD symptomatology will be associated with deontological judgements.

Hypothesis Two. People with OCD will make more deontological than utilitarian judgements, in comparison to those without OCD.

Hypothesis Three. Imagery will mediate the relationship between OCD and moral judgements.

2. Method

This chapter begins with a description of the participants who completed the study. It then describes the recruitment strategy, materials used and the full procedure for conducting the study. It also discusses ethical considerations and provides information on the study development and piloting process.

2.1 Participants

One hundred and forty five participants (120 females, 23 males, one participant chose not to disclose this information and one stated ‘other’) were recruited online (full details of recruitment are provided in section 2.2). They completed the study between October 2015 and March 2016. The mean age of participants was 27.86 years ($SD=12.13$), and the range was 17 to 70 years.

2.1.1 OCD group. Research has demonstrated that a score of 21 or higher on the Obsessive-Compulsive Inventory-Revised (OCI-R) is an indicator of the presence of OCD (Foa et al., 2002). Research also suggests that a score of 16 or higher on the Yale-Brown Obsessive-Compulsive Scale-Self-Report (Y-BOCS-SR) is consistent with a diagnosis of OCD. Criteria for the OCD group was therefore a score of 21 or higher on the OCI-R and a score of 16 or higher on the Y-BOCS-SR. Participants scoring above the cut-off on one of the OCD measures, but not on the other were not included in the OCD group. Thirty participants, who completed the study, met these criteria (25 female, 4 males, one participant stated ‘other’). The mean age of the OCD group was 27.93 ($SD=11.19$).

2.1.2 Comparison group. Previous studies have set arbitrary cut-offs to identify a group of individuals for non-OCD comparison groups (e.g., Jones & Bhattacharya, 2014). In order to obtain a comparison group of a similar size to that of the OCD group a sample was selected based on the lowest 18% of scores on the OCI-R and Y-BOCS-SR. This enabled comparisons between the individuals who scored highest on the OCI-R and Y-BOCS-SR (from now on, this is referred to as the OCD group); and those who scored lowest on these measures (this group is referred to as the comparison group). Following this procedure, inclusion for the comparison group comprised of scoring lower than 13 on the OCI-R and lower than 7 on the Y-BOCS-SR. Twenty-seven participants, who completed the study, met these criteria (21 females, 6 males). The mean age of the comparison group was 30.93 ($SD=12.17$). Further demographic information, including information on representativeness, is provided in the Results chapter.

2.2 Recruitment

2.2.1 Recruitment process. Participants were recruited via the social media forums Facebook and Twitter, the Royal Holloway, University of London (RHUL) Undergraduate Psychology Participation Scheme and OCD charities including OCD Action, OCD Ireland and the International OCD Foundation (see appendix C for an example advert). Participants were self-selected, meaning that they were invited to take part if they wished to. All recruitment methods gave a brief outline of the study as well as an Internet link leading to further information and the study itself. All participants were informed that taking part in the study was voluntary and that they could withdraw at any time, without this having any adverse consequences. It was emphasised that any student participant could withdraw at any time without those

actions affecting their academic studies. Participants were also informed that the study would be completely confidential and they were invited to contact the researcher and supervisors with any questions. Participants were then given the opportunity to provide their consent to take part. The study took place online, via the research platform Qualtrics (Provo, UT, 2015), and any Internet enabled device could be used to complete it. Participants therefore took part in the study independently, at a time and location of their choice.

2.2.2 Inclusion/Exclusion criteria. Participants whose level of English was not sufficient to complete the study, as well as those who were unable to complete an online questionnaire for any reason and those who had a diagnosis of psychosis, as determined by self-report on the demographic questionnaire, were excluded from the study. One participant, who self-reported a diagnosis of psychosis, was consequently excluded from the analysis.

2.2.3 Power analysis. The number of participants required for the current study was calculated using an a priori power analysis. The calculation was based on Franklin et al. (2009) who investigated moral judgements in OCD using a similar methodology to that employed in the current study. Although the effect was not statistically significant, they found OCD symptom severity to be inversely related to choosing to act according to utilitarian principles, with a medium effect size ($r(18) = -.32, p = .18$). The power analysis for this study was therefore calculated based on the assumption that it would obtain medium effect sizes.

In order to obtain a power level of .80 and α of .05, the recommended sample size for a correlational analysis is 85 (Cohen, 1992). It was therefore decided that a

minimum of 85 participants would be required. This was based on the primary hypothesis, Hypothesis One, which investigated whether OCD symptomatology would correlate with deontological moral judgements. The number of participants in the study (N=145) met these criteria and lead to an actual power level .78 based on a correlational analysis, with alpha set to 0.05. Recruitment was not stopped at the target number of 85 participants required for a correlational analysis (Hypothesis One) due to the lack of participants meeting criteria for the OCD group when the target of 85 was met and the importance of stopping recruitment from the online sites aimed at the OCD and non-OCD comparison groups at the same time.

2.2.4 Sample attrition. Two hundred and sixty nine participants began completing the study. Of these participants, 146 completed all of the questionnaires. One hundred and twenty three participants withdrew from the study once they had started making the attrition rate 45.72%. As one participant met criteria for exclusion from the study, the overall percentage of those participants not used in the analyses was 46.09%. Therefore, the participants in the study (N=145) represented 53.90% of the original 269 beginning the study. The attrition rate is shown in more detail in the flow chart below (Figure 2.1). Possible implications of this large attrition rate are discussed further in the Discussion chapter.

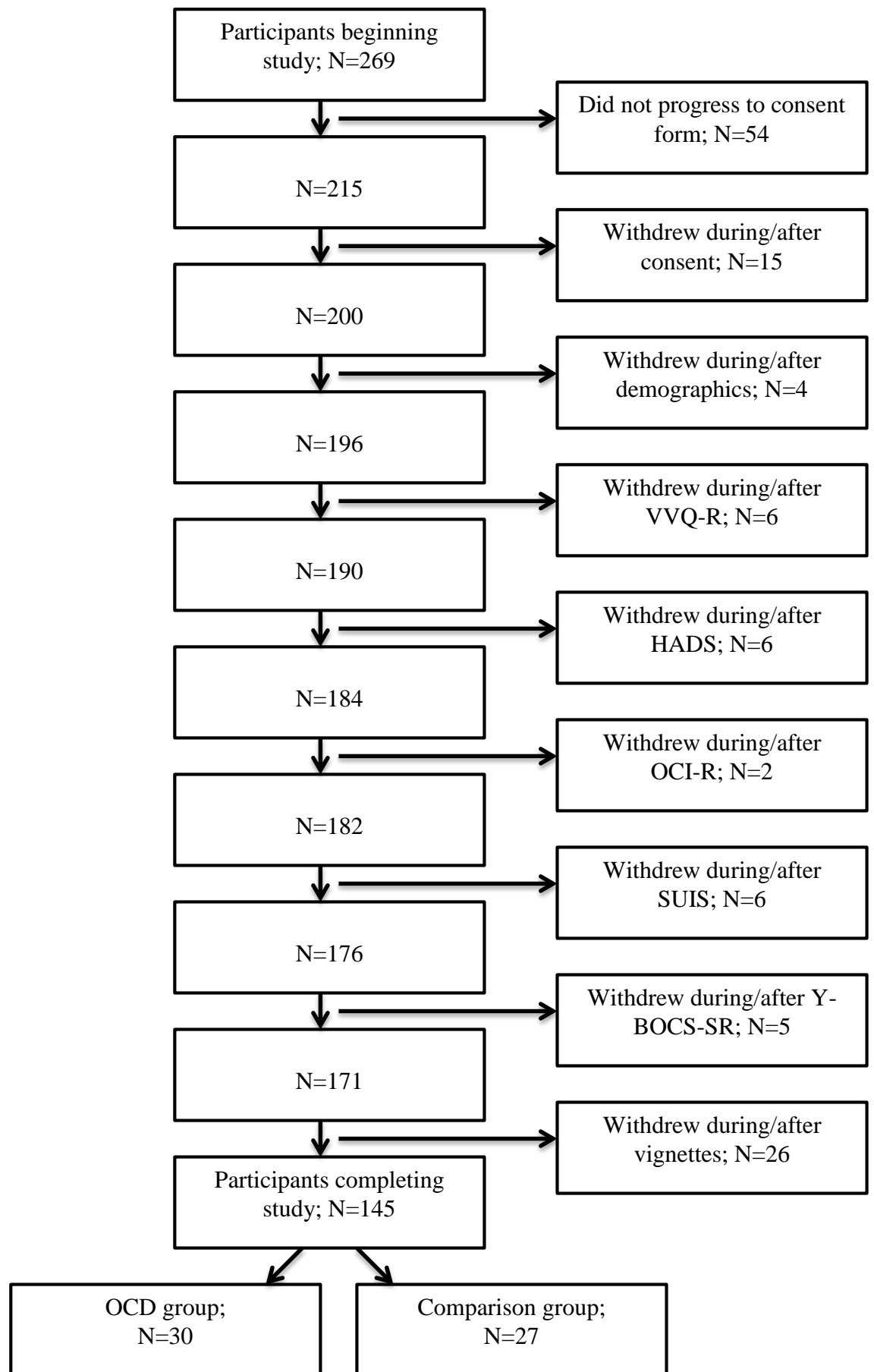


Figure 2.1 Sample attrition

2.3 Materials and Measures

2.3.1 Socio-demographic information. A demographic questionnaire (appendix E) was designed to gather information about the participants' socio-demographic characteristics. This was a self-report questionnaire, which participants completed at the beginning of the study. It asked for information including gender, ethnicity, marital status, employment status, highest level of education and religion. Participants were also asked about any current or previous diagnoses of OCD, whether or not they have received any psychological treatment for this and whether they took any medication for anxiety. Finally, participants were asked whether they had ever had any other diagnoses of mental health conditions. Participants who answered 'yes' were invited to give further detail.

2.3.2 Measures of imagery. Measures of imagery were considered in order to select the measure that was most appropriate for this research. Previous research that has shown a relationship between moral judgements and imagery (Amit & Greene, 2012) used a computerised task to measure the preferential cognitive style of their participants. It was not possible to use the same task due to the time involved for participants to complete this offline, and the potential impact of this on recruitment. Therefore, a self-report measure of the same constructs was selected for use in the current study. As this part of the study was novel and exploratory in nature, a measure of trait imagery was also selected, as a measure of general imagery use. These measures are described below.

Verbaliser-Visualiser Questionnaire – Revised (VVQ-R). The VVQ-R (Kirby, Moore & Schofield, 1988; see appendix G) is a 20-item self-report measure of

verbal/visual cognitive style in everyday scenarios. It is used to measure whether participants' cognitive style is more visual or verbal and was chosen for use in the current study as the most commonly used self-report measure for determining visual/verbal cognitive style (Antonietti & Giorgetti, 1998). The VVQ-R includes ten statements that relate to a verbal cognitive style for example 'I enjoy doing work that requires the use of words' and ten that relate to a visual cognitive style, for example 'The old saying 'a picture is worth a thousand words' is certainly true for me'. There are also ten optional questions that assess a third cognitive style termed 'dream vividness'. As this factor has been confirmed to be independent of the scale and analyses justify the use of the 20-item scale (Kirby et al. 1988) it was not included in the current study.

Participants are asked to read the statements and mark them as 'true' or 'false'. Responses are summed, taking into account positively and negatively phrased statements, within each dimension. So as not to create false categorisation the author did not create cut off scores. Rather, they advised that scales should be used as continuous variables (Kirby, personal communication, January 9, 2015) with lower Visual/Verbal scores indicating the tendency the individual has towards that cognitive style.

The VVQ-R is a well-established measure, which has been shown to have good construct validity and adequate reliability ($\alpha=.70$ and $.59$ respectively; Kirby et al., 1988) although, to the author's knowledge, it has not been used specifically with OCD samples. Kirby et al., (1988) showed that scores in the visual and verbal dimensions of the VVQ-R correlate with objective measures of visual and verbal abilities respectively, as measured by well known cognitive tests (ACER Higher Test,

Form ML; Australian Council for Educational Research, 1981 and The Card Rotations test and the Surface Development test of the Kit of Factor-References Cognitive Tests; Ekstrom, French, Harman & Derman, 1976). Furthermore, Kraemer, Rosenberg and Thompson-Schill, (2009) found that cognitive style, as defined by scores on the VVQ-R, correlates with physiological activity in visual and verbal brain regions.

Spontaneous Use of Imagery Scale (SUIS). The SUIS (Reisberg, Pearson & Kosslyn, 2003; see appendix I) is a self-report scale commonly used to measure participants' use of visual imagery (e.g., Hales, Deeprose, Goodwin & Holmes, 2011; Holmes, Mathews, Mackintosh & Dalgleish, 2008; Holmes, Coughtrey & Connor, 2008). It is a 12-item questionnaire that measures an individual's spontaneous use of visual, non-emotional, imagery in everyday life. Participants are given descriptions of situations in which images are involved such as 'When I think about visiting a relative, I almost always have a clear mental picture of him or her'. They are asked to indicate how much, on a likert scale of 1-5, each is appropriate for them (1 represents 'never appropriate', 3 represents 'appropriate about half of the time' and 5 represents 'completely appropriate'). A total score is calculated by adding the total of the 12 item scores, resulting in a total score ranging from 12 to 60. Higher scores indicate more use of imagery (Nelis, Holmes, Griffith & Raes, 2014).

The author suggested the SUIS to have high internal consistency (correlations of at least .98) (Reisberg et al., 2003) and this was confirmed by McCarthy-Jones, Knowles and Rowse (2012) who reported an internal consistency of $\alpha = .83$. A Dutch translation of the measure has been shown to have acceptable reliability (Chronbach's alpha of .72) and convergent validity (Nelis et al., 2014). Furthermore, a clear

relationship has been found between the SUIS and the Vividness of Visual Imagery Questionnaire (Marks, 1973) suggesting that the two measures assess a related construct (Reisberg et al., 2003).

2.3.3 Measures of OCD. As the study used an online methodology to increase access, and to ensure the same methods of data collection were employed for the two groups, it was not possible to use a clinician lead diagnostic tool such as the Structured Clinical Interview for DSM Disorders (SCID) (First, Spitzer, Gibbon & Williams, 1996). Limitations of this approach will be considered in the Discussion chapter. In the absence of a diagnostic interview, and following recommendations in the literature (Anholt et al., 2009), two self-report measures of obsessive compulsive symptoms were used and groups were selected according to them meeting cut-offs on both of these measures. The OCI-R (Foa et al., 2002) is a tool that has been shown to have good diagnostic ability (Abramowitz & Deacon, 2006) and the Y-BOCS-SR (Baer, 1991) has been shown to have particular strengths in assessing symptom severity (Steketee, Frost & Bogart, 1996). For these reasons, both were used in the current study.

Obsessive Compulsive Inventory – Revised (OCI-R). The OCI-R (Foa et al., 2002; see appendix H) is an 18 item self-report questionnaire that assesses for the broad range of symptoms common in OCD, including obsessions and compulsions. Participants are given statements and are asked to rate, on a scale of 0 to 4, how much that experience has distressed or bothered them during the past month (zero represents ‘not at all’, 2 represents ‘moderately’ and 4 represents ‘extremely’). Total scores are calculated by adding the item scores, with the possible range of scores being 0-72. The mean score for an individual with OCD is 28 ($SD = 13.53$) and a score of 21 or

more has been shown to be an indicator of the presence of OCD (Foa et al., 2002). The OCI-R has been found to be a good measure to discriminate OCD from other anxiety disorders (Abramowitz & Deacon, 2006) and has been used to distinguish between OCD and comparison groups in the literature (Jones & Bhattacharya, 2014). The scale has also been recommended for making diagnostic decisions (Grabill et al., 2008) and has also been used in various languages and cultural contexts (Overduin & Furnham, 2012).

Foa et al. (2002) reported the scale to have good internal consistency with alphas ranging between 0.81 and 0.93. Similar alphas were reported by Abramowitz and Deacon (2006) and Hajcak, Huppert, Simons and Foa (2004). Foa et al. (2002) found the scale to have good test-retest reliability among individuals with OCD ($r = .74$ to $.91$) and for non-anxious controls ($r = .57$ to $.87$). The OCI-R has good construct validity (Foa et al., 2002) with total scores correlating with the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) (Goodman et al., 1989; $r = .53$), the Maudsley Obsessive Compulsive Inventory (Hodgson & Rachman, 1977; $r = .85$) and the National Institute of Mental Health Global Obsessive-Compulsive Scale (Insel et al., 1983; $r = .66$) for clinical and non-clinical individuals.

Yale-Brown Obsessive-Compulsive Scale - Self-Report (Y-BOCS-SR). The Y-BOCS-SR (Baer, 1991; see appendix J) is a 68 item self-report questionnaire, adapted from the clinician-administered Y-BOCS (Goodman et al., 1989). The Y-BOCS-SR consists of a 58 item symptom checklist, which divides up symptoms of OCD into categories including aggressive obsessions, contamination obsessions, sexual obsessions, hoarding/saving obsessions, religious obsessions, obsession with the need for symmetry or exactness, miscellaneous obsessions, somatic obsessions,

cleaning/washing compulsions, checking compulsions, repeating rituals, counting compulsions, ordering/arranging compulsions, hoarding/collecting compulsions and miscellaneous compulsions. The Y-BOCS-SR assesses the type of symptoms in OCD (Gonner, Ecker & Leonhart, 2009) as well as measuring the severity of these and facilitating diagnostic decisions (Grabill et al., 2008). Indeed, it has been used in this way in previous studies in the literature (Marques et al., 2010).

Participants are asked to indicate whether the 58 obsessions and compulsions listed affect them, in order to help them to answer the next set of 10 questions. It then asks participants to rate, on a 5-point likert scale (where 0 = 'none' and 4 = 'extreme'), how distressing and impairing any thoughts and compulsions are. Scores are summed for the 10 questions in the second part of the Y-BOCS-SR questionnaire. A score of 16 or more indicates moderate symptoms of OCD and is a recommended cut-off score (Steketee et al., 1996). The Y-BOCS-SR has good internal consistency ($\alpha = .90$ in a non-clinical sample and $.79$ in a clinical sample; Steketee et al., 1996), test-retest reliability is excellent ($.88$ in a non-clinical sample as unfortunately there is no reported data available from clinical samples) and correlations ($r=.75$ in non-clinical sample, $.79$ in a clinical sample) with the clinician rated version show good convergent validity (Steketee et al., 1996).

2.3.4 Measure of mood. A measure of mood was also selected for use in the study due to the previous association found between depression and deontological moral judgements (Valdesolo & DeSteno, 2006).

Hospital Anxiety and Depression Scale (HADS). The HADS (Zigmond & Snaith, 1983; see appendix F) is a 14 item self-report questionnaire that identifies

clinical levels of anxiety disorders and depression through the use of two subscales (HADS-A and HADS-D respectively), both of which are internally consistent (HADS-A $\alpha = .76$ (Martin & Thompson, 2000) - $.93$ (Moorey et al., 1991); HADS-D $\alpha = .72$ (Martin & Thompson, 2000) - $.90$ (Moorey et al., 1991)). It has been used in previous studies specifically looking at reasoning biases in OCD (e.g., Jacobsen, Freeman & Salkovskis, 2012) as well as numerous other studies that use OCD samples (e.g., Faull, Joseph, Meaden & Lawrence, 2004; Snorrason, Smari & Olafsson, 2011; Ryan, 2004). The items of the HADS are rated on a 4-point likert scale from 0-3. The totals from each subscale (depression and anxiety) are then calculated, with a maximum score of 21 on each. A score of 11 or above on a subscale indicates caseness for a mood or anxiety disorder (Zigmond & Snaith, 1994).

There is evidence to show that the HADS is a good measure to assess for the presence and severity of anxiety disorders and depression in both clinical and non-clinical populations (Bjelland, Dahl, Haug & Neckelmann, 2002). Bjelland et al. (2002) conducted a review of 747 studies that used the HADS and found it to perform as well as other measures that assess for symptoms of depression and anxiety. Specifically, the HADS and the Beck depression inventory (BDI; Beck, Ward, Mendelson, Mock & Erbaugh, 1961) had a correlation of $r = 0.73$ and they found correlations of $r = 0.68$ to 0.71 with the State-Trait Assessment Inventory (STAI; Spielberger, 1983). The concurrent validity of the scale was therefore rated as 'good to very good' (Bjelland et al., 2002). Furthermore, the HADS has been validated for use with a range of ages and can be used in a variety of settings (Snaith, 2003).

2.3.5 Vignettes. The methodology used in studies investigating moral reasoning typically involves the presentation of vignettes depicting moral dilemmas

and asking participants to answer questions on these. The number of vignettes ranges across studies from four (Moulding, Kyrios & Doron, 2007) to forty (Greene et al., 2008).

In line with other studies using a similar number of vignettes (e.g., Amit & Greene, 2012) as well as following feedback from piloting the measures, it was decided that six vignettes would be included in the current study (see appendix K). As the study was seeking to evaluate deontological/utilitarian constructs used in previous research (e.g., Amit & Greene, 2012; Franklin et al., 2009; Mancini & Gangemi, 2015) it was deemed important to use the same vignettes as those studies. All of these used vignettes the same as or based on those in Greene et al. (2001) and Greene et al. (2004).

Therefore, in the current study three vignettes were selected from those used in Greene et al. (2001; 2004), which have been widely validated within non-clinical samples and have been shown to be related to imagery (Amit & Greene, 2012), and three were selected from Mancini and Gangemi (2015), which have been validated with OCD samples and used to find significant differences in the moral judgements of an OCD and comparison group (Mancini & Gangemi, 2015). The three vignettes used from Mancini and Gangemi (2015) were chosen from a possible four at random. This was deemed to be acceptable as they had all been validated as measuring the same constructs and, furthermore, there had been no significant differences between these vignettes in previous studies (Gangemi, personal communication, October 24, 2015). The three vignettes selected from Greene et al. (2001; 2004) were chosen based on the percentage of deontological, in comparison to utilitarian judgements being closest to 50% in their study. In other words, there was little difference in the proportions of

non-clinical participants choosing deontological vs. utilitarian options, in response to those vignettes. Again, they had also been validated in previous studies, as measuring the same constructs. Any potential differences between these vignettes could be explored in the analyses. For the purposes of interpretation, these were labelled as ‘Greene’s vignettes’ and ‘Mancini and Gangemi’s vignettes’ respectively.

Following established research paradigms, participants were asked questions following the presentation of vignettes. They were asked to imagine they were in the proposed scenario and asked to answer whether they should act according to the utilitarian action as well as whether this would be morally acceptable (yes/no). This was followed by visual analogue scale (VAS) questions. Specifically, participants were asked ‘How morally acceptable would this be?’ and given a likert scale from one (completely unacceptable) to seven (completely acceptable). They were also asked how vivid any imagery created was, again using a scale from one to seven. Vignettes were all written from a utilitarian perspective, meaning that the proposed action was a utilitarian action. Therefore, vignettes answered ‘No’ and rated as being morally unacceptable indicated a deontological moral judgement. Mean scores were calculated, with lower mean moral acceptability scores indicating more deontological judgements and lower vividness scores indicating less vividness experienced in the imagery.

2.4 Procedure

2.4.1 Study procedure. When accessing the online study participants were initially presented with an information sheet (appendix B). If they were happy to take part, they were then able to proceed to a consent form for the study (appendix D).

Consenting participants progressed to completing the series of questionnaires detailed above and the set of moral dilemmas. The questionnaires were presented in the same order for each participant. The demographic questionnaire was presented first, followed by the VVQ-R, HADS, OCI-R, SUIS, Y-BOCS-SR and vignettes. On average, the study took participants 42 minutes to complete. Participants were encouraged to answer all questions however they were able to leave questions unanswered if they wished to. In order to ensure that unanswered questions were not questions participants had forgotten to answer, the programme was set such that an error message was displayed. This was intended to reduce the number of unintentionally missed questions.

2.4.2 Compensation. First year Royal Holloway, University of London (RHUL) psychology students received two course credits for their participation in the study. All other participants, that is, non first-year RHUL Psychology undergraduates were given the opportunity to be entered into a prize draw. They were asked to provide an email address to be contacted for these purposes. Email addresses were stored separately from responses, on a password-protected document. No one except for the researcher and supervisors had access to this or to any other participants' data. The prize draw was drawn after data collection had finished, in April 2016. One £50 and two £25 vouchers were awarded to participants who had entered into the prize draw and who had provided an email address for contact purposes. These were selected at random using SPSS, contacted via their email address and sent the vouchers.

2.4.3 Debrief. Debriefing procedures began by thanking participants for their participation. They were informed that some people may find reading scenarios, such

as the ones in the study, distressing and that some people may be shocked or surprised at the decisions they make. Participants were offered details of organisations where they could access support if they felt they were affected by the study and wanted support for this, or if they wanted information on psychological wellbeing or OCD (see appendix L). These organisations included Improving Access to Psychological Therapies (IAPT), NHS Choices, The Samaritans, contacting a GP and RHUL student counselling services. In the event of an emergency, and if participants were feeling at risk of harming themselves or were experiencing suicidal thoughts, they were advised to attend their local A&E department. Participants were reminded that they could contact the researcher and supervisors at any time to discuss any questions or concerns they had about the study.

2.5 Ethical Considerations

Full ethical approval for the study was granted by the ethics committee at Royal Holloway, University of London (reference number: 2015/002R1; appendix A). This was obtained before piloting and before any participants were recruited for the study.

The study was informed by relevant research guidelines including the Code of Human Research Ethics (BPS, 2010), Ethics Guidelines for Internet-mediated Research (BPS, 2013) and Ethics Guidelines (RHUL, 2010) published by the Department of Psychology at RHUL. In addition to the general considerations of ethical recruitment, information, consent and confidentiality discussed above, the study posed two ethical issues.

Firstly, due to the diagnostic abilities of the OCD measures, the study had the potential to identify clinical issues. The study was anonymous in order to increase the

likelihood of individuals participating in the study (Houston & Jefferson, 1975) and to reduce social desirability response bias (Colton & Covert, 2007). The anonymity however meant that it was not possible to inform individuals of potential diagnoses of OCD. Individuals with OCD generally have good insight into their condition (Eisen et al., 2001), usually recognise their compulsions as ‘pointless or ineffectual’ (ICD-10; 2016, F42) and enter into treatment voluntarily. In light of this, it was deemed acceptable to provide details of support organisations, and advice to individuals to contact their GP if they wanted to access treatment for or information on OCD.

Secondly, it was possible that the vignettes may have created some distress in individuals due to the nature of their content. However, all of the vignettes depicted scenarios that were uncommon and did not represent every day concerns. Furthermore, they did not depict content related to specific OCD concerns. It was therefore not anticipated that the study would cause any lasting psychological or negative emotional effects. Nevertheless, all participants were debriefed at the end of the study and were given information about where they could access support if required.

2.6 Participant Feedback

Four members of a student sample were consulted during the development of the study in order to gain feedback on the design and to consider making the study as accessible as possible. These members were recruited using convenience sampling (Baker et al., 2003), with an email requesting their involvement. In particular, feedback was elicited on different online presentation platforms as well as the presentation of the vignettes and the overall length of time they felt was appropriate to

spend on a voluntary research study. Their feedback was instrumental in shaping the choice of online platform, as feedback was that Qualtrics was clear and convenient to use. It was also possible to access it using mobile devices, which was appealing to the group. The group felt it was appropriate to spend 30-60 minutes completing the study and consideration of this, as well as the number needed in order to answer research questions reliably, contributed to determining the number of vignettes to be included. The development of the recruitment strategy was discussed and the growing use of social media was highlighted. It was therefore considered as a potential recruitment avenue.

2.7 Piloting

Once developed and ethical approval granted, the initial survey was piloted on a group of eight volunteers, two of whom had diagnoses of OCD. Again these were recruited using convenience sampling (Baker et al., 2003) and participated on a voluntary basis. Feedback from a number of the volunteers was that the study was too long and the vignettes repetitive. At the time, the study included eight vignettes. Consequently, the vignettes were reduced to six. Some typographical and presentation changes were also made, as a result of feedback, in order to make the study clearer to complete.

2.8 Statistical Analysis

The study was quantitative and cross-sectional in nature investigating the relationship between symptoms of OCD and moral judgements, as well as the potential impact of imagery on this relationship. Statistical analyses were used to explore each of the hypotheses. These analyses included Pearson's Product Moment Correlations,

independent samples *t*-tests, Chi-square/Fisher's Exact Tests and meditational analyses with bootstrapping using the PROCESS macro (Hayes, 2012). Mood was controlled for, in all analyses, due to its association with deontological moral judgements (Valdesolo & DeSteno, 2006). The analyses are described in more detail in the Results chapter.

3. Results

This chapter outlines the results of the study. The plan for analysis is described first and then an outline of data screening and preliminary analyses is provided. A description of the sample and differences between groups is then given, followed by the results of the main analyses in relation to each hypothesis.

3.1 Analysis Plan

The data were analysed using the IBM Statistical Package for the Social Sciences (SPSS) software, version 21 (IBM, 2012). Results are reported to two decimal places and exact p values are provided to two decimal places, unless p is less than .001 or where more decimal places are needed to represent the results of the mediation analyses. t values, degrees of freedom and statistical significance where equal variances are not assumed are reported when Levine's Test for Equality of Variances was significant (less than 0.05). Alpha levels were set at $p < 0.05$ and all hypothesis testing was two-tailed, in order to minimise the possibility of Type I error. As recommended by Nakagawa (2004) a bonferroni test was not calculated, in order to maintain power and minimise the possibility of Type II error, however effect sizes are reported where appropriate.

3.2 Treatment of Data

All data were downloaded from Qualtrics into SPSS by the researcher. The data were screened prior to analyses, following the recommendations of Tabachnik and Fidell (1996). This screening involved checking for any errors, ensuring that data for each variable were within expected ranges and that descriptive statistics such as the means

and standard deviations for each variable were plausible. Negatively phrased questions on the VVQ-R and HADS were reversed and total values were calculated for each measure and relevant subscales. Mean values were also calculated for the continuous vignette items (moral acceptability and vividness of image).

3.2.1 Missing data. As biases in statistical analyses are more likely to occur when datasets include missing data (Rubin, 1987), particularly when it is not missing at random (Dong & Peng, 2013), missing data and any relevant patterns were analysed using Little's MCAR test (Little, 1988). All variables were deemed to have data that were missing completely at random, due to their non-significant values (p greater than 0.05) (see Table 3.1).

The values of non-missing data support the calculation of the values of missing data (Schafer & Olsen, 1998) and, in light of this, it is acceptable to consider using imputation methods for missing data in order to form a complete dataset. This increases power and decreases the risk of bias (Scheffer, 2002). Expectation Maximisation (EM; Dempster, Laird & Rubin, 1977) was selected for use in this study, as it is a recommended method for imputing data that is missing at random (Schafer & Graham, 2002). This method uses the values of non-missing data, combined with statistical assumptions, in order to estimate the distribution of values and hence missing data. EM was chosen as it is relatively simple to implement (Dempster, Laird & Rubin, 1977), stable (Couvreur, 1996) and, unlike Multiple Imputation (MI), can be used with the PROCESS mediation macro (Hayes, 2012). Furthermore, there is evidence to suggest that there are no significant differences between EM and MI when used for imputation purposes (Lin, 2010).

Table 3.1. Little's MCAR tests for continuous variables

Variable	Subscale	Little's MCAR
<u>Hospital Anxiety and Depression Scale</u>		
	HADS-Depression	$\chi^2(6)=3.29,$ $p=0.77$
<u>Obsessive Compulsive Inventory-Revised</u>		
		$\chi^2(17)=8.13,$ $p=0.96$
<u>Spontaneous Use of Imagery Scale</u>		
		$\chi^2(10)=5.36,$ $p=0.87$
<u>Yale-Brown Obsessive- Compulsive Scale-Self-Report</u>		
		$\chi^2(65)=79.00,$ $p=0.11$
<u>Vignettes</u>		
Moral Acceptability		
<i>How morally acceptable would this be?</i>		$\chi^2(20)=17.18,$ $p=0.64$
	Moral Acceptability Greene	$\chi^2(6)=9.86,$ $p=0.13$
	Moral Acceptability Mancini and Gangemi	$\chi^2(2)=0.03,$ $p=0.99$
Vividness		
<i>How vivid was the image?</i>		$\chi^2(11)=13.21,$ $p=0.28$
	Vividness Greene	$\chi^2(3)=2.74,$ $p=0.43$
	Vividness Mancini and Gangemi	$\chi^2(4)=6.61,$ $p=0.16$

Before completing EM, the amount of missing data was also considered.

There is not yet an established upper cut-off in the literature regarding the percentage of missing data for each individual on a given variable in a dataset for which EM can be used however guidance suggests an upper limit of 20% (Garson, 2015) or one in six items (17%) missing per participant. In light of the variability in these suggestions the most conservative suggestion was employed, therefore participants with greater than one in six items missing on each variable were not included in the imputation.

This affected twelve participants with more than 1 in 6 items missing on the Y-BOCS-SR.

In order to explore any potential differences between the two vignette types (Greene's vignettes and Mancini & Gangemi's vignettes), any missing data was explored for these sets of vignettes separately. As the author specific vignettes (Greene/Mancini and Gangemi) only included three questions, and therefore any missing value exceeded the 1 in 6 requirement, it was also not possible to include these in the imputation (this included three participants with moral acceptability data missing in response to Greene's vignettes, one participant with moral acceptability data missing in response to Mancini and Gangemi's vignettes, two participants with vividness data missing in response to Greene's vignettes and one participant with vividness data missing in response to Mancini and Gangemi's vignettes). Neither is it possible to use EM with categorical variables (two participants had one item missing on the VVQ-R scale), so missing data falling under either of these two categories were left as missing in the dataset. These missing data points were treated with pairwise deletion, meaning that they were not included in analyses that involved the variables with missing values. This method is commonly employed for managing missing data (Peugh & Enders, 2004), which is missing completely at random (Schafer & Graham, 2002). All other eligible missing data were imputed within Missing Values Analysis in SPSS, using EM. It is possible that more missing data occurred during the Y-BOCS-SR and vignettes as they were the final parts of the study and, by this time, participants may have been more inclined to leave items missing in order to finish the study.

3.2.2 Normality of data. The skewness and kurtosis scores of each variable were calculated to assess whether they were normally distributed. In order to do this, histograms with normal curves were inspected and skewness and kurtosis z-scores were calculated, both for the overall dataset and OCD and comparison groups separately. z-scores were deemed to be acceptable if they were below 3.29 ($p < 0.001$) (Field, 2009) for the whole dataset ($N=145$). The small standard errors in large sample sizes make it acceptable to use this value as an upper limit for samples of 100 or more (Field, 2009; Tabachnick & Fidell, 1996). For the OCD and comparison groups, which were smaller datasets ($N=30$ and $N=27$ respectively), z-scores were deemed to be acceptable if they were below 2.58 ($p < 0.01$) (Field, 2009). Variables were transformed such that they all met criteria for normality (See appendix M for details of transformations). Where comparisons were being made between groups with transformed scores, the same transformations were applied to the same variables in both groups, even where one variable was normally distributed (Field, 2009).

3.2.3 Outlier analysis. Extreme outliers are data points that deviate significantly from the other data points. It is important to be aware of these because they may lead to distortion of statistics, potentially causing less valid results (Field, 2009). For this reason, outliers were checked for on each variable in each dataset using boxplots. Outliers were deemed to be extreme if the value was more than three standard deviations away from the mean of the relevant variable (Field, 2009).

In overall dataset, results indicated one extreme outlier on the VVQ-Visual variable and three extreme outliers on the HADS depression variable. There were no outliers on the variables within the OCD group dataset. In the comparison group dataset, there was one extreme outlier on the HADS depression variable. As there was

no reason to conclude that these data points did not belong the dataset, they were not removed (Field, 2009). As eliminating the variable can lead to a loss of power and the possibility that the data point is inappropriately viewed as not belonging to the dataset, the preferential method for managing any adverse impact of outliers to transform the variable (Field, 2009; Tabachnick & Fidell, 1996). This transforms the distribution, bringing it closer to normality.

Outliers were therefore assessed again following the variable transformations. Within the whole dataset, one outlier remained on the HADS Depression variable. This was winsorised, replacing the outlying score with the value of the next score and this was balanced by doing the same at the other end of the distribution. Following this, no remaining outliers were detected and all variables fell within acceptable limits for both skewness and kurtosis, both for the sample as a whole and for separate groups (OCD and comparison). It was therefore considered appropriate to use parametric tests, to maximise power and reduce the chances of type II errors.

3.3 Completing Versus Non-completing Participants

In order to learn about any possible biases in those who completed the study, and those who did not, differences in psychopathology and socio-demographic variables between groups of participants who completed the study and those who withdrew at various stages were compared. Participants were divided into three groups: those who withdrew from the study during or after the questionnaires (Time 1; N=25), participants who withdrew from the study during or after the vignettes (Time 2; N=24) and participants who completed the study (Time 3; N=145). Groups were compared using the data that was available.

Table 3.2 gives a description of these groups and shows the results of a one-way ANOVA, which was used to compare the groups on the continuous variables (age, OCI, YBOCS-SR and HADS). Bootstrapping was used due to the unequal sample sizes (Krishnamoorthy, Lu & Mathew, 2007). Table 3.3 shows the results of Chi-square or Fisher's Exact Tests (FET; used when expected cell count was less than five), used to compare the groups on the categorical variables. These variables were collapsed where appropriate, as the numbers in some individual groups were not large enough to produce meaningful results. As Tables 3.2 and 3.3 show, no differences were found between the three groups. This suggests that participants withdrew from the study at various stages for reasons that are not accounted for by differences in psychopathology or demographics.

Table 3.2. Descriptive data for continuous variables and group differences at Time 1, Time 2 and Time 3

	Group						ANOVA
	Time 1		Time 2		Time 3		
	Mean [S.D]	Range	Mean [S.D]	Range	Mean [S.D]	Range	
Age	28.46 [7.80]	18-49	30.75 [12.07]	16-65	27.86 [12.13]	17-70	$F(2,150)=1.52, p=0.22$
HADS	14.26 [8.08]	3-30	16.38 [7.91]	3-32	14.24 [8.16]	0-38	$F(2,150)=1.27, p=0.28$
OCI-R	22.00 [15.60]	4-49	25.71 [15.91]	4-60	20.85 [14.73]	0-62	$F(2,150)=2.43, p=0.09$
Y-BOCS-SR	9.33 [9.02]	0-18	14.17 [12.21]	0-35	11.68 [9.98]	0-40	$F(2,150)=2.29, p=0.11$

Table 3.3. Descriptive data for categorical variables and group differences at Time 1, Time 2 and Time 3

		Group			χ^2 /Fisher's Exact Test (FET) for group differences
		Time 1 Frequency (%) (N=25)	Time 2 Frequency (%) (N=24)	Time 3 Frequency (%) (N=145)	
Gender	Male	4 (16)	3 (12.50)	23 (15.86)	$p=1.00$; <i>FET</i>
	Female	20 (80)	21 (87.50)	120 (82.76)	
	Other/Missing	1 (4)	0 (0)	2 (1.38)	
Ethnicity	White British	18 (72)	17 (70.83)	98 (67.59)	$\chi^2(2)=0.43$, $p=0.87$
	Not White British	6 (24)	7 (29.17)	45 (31.03)	
	Missing	1 (4)	0 (0)	2 (1.38)	
Marital status	With partner	14 (56)	16 (66.67)	70 (48.28)	$\chi^2(2)=2.86$, $p=0.24$
	Not with partner	9 (36)	8 (33.33)	70 (48.28)	
	Missing	2 (8)	0 (0)	5 (3.45)	
Employment status	Working	10 (40)	14 (58.33)	58 (40)	$p=0.44$; <i>FET</i>
	Not working	3 (12)	2 (8.33)	17 (11.72)	
	Student	8 (32)	6 (25)	63 (43.44)	
	Missing	4 (16)	2 (8.33)	7 (4.83)	
Highest Education level	Compulsory	1 (4)	1 (4.17)	3 (2.07)	$p=0.64$; <i>FET</i>
	Further	8 (32)	8 (33.33)	59 (40.69)	
	Higher	15 (60)	13 (54.17)	78 (53.79)	
	Missing	1 (4)	2 (8.33)	5 (3.45)	

		Group			χ^2 /Fisher's Exact Test (FET) for group differences
		Time 1 Frequency (%) (N=25)	Time 2 Frequency (%) (N=24)	Time 3 Frequency (%) (N=145)	
Religion	No religion	11 (44)	11 (45.83)	89 (61.38)	$\chi^2(2)=3.49, p=0.18$
	Religion	13 (52)	12 (50)	54 (37.24)	
	Missing	1 (4)	1 (4.17)	2 (1.38)	

Differences in those completing the study and those not completing the study were also explored, specifically in terms of diagnoses of OCD (see Table 3.4). As the group (OCD or comparison) was determined by the measures of psychopathology (OCI and YBOCS-SR), this group comparison was only possible for those who had completed these questionnaires. As the vignettes followed the questionnaires this comparison was therefore made between participants who started but did not complete the vignettes, and those who completed the vignettes. A Chi-square analysis showed significant differences between the groups ($\chi^2(1) = 11.06, p < 0.01$). Specifically, fewer completers had a diagnosis of OCD than expected (30 compared to the expected 36.7) and more non-completers had a diagnosis of OCD than expected (13 compared to the expected 6.3). This suggests that having a diagnosis of OCD may have prevented participants from completing the study. Implications of this finding will be considered in the Discussion chapter.

Table 3.4. Participants completing versus not completing the study and their diagnoses of OCD.

	Completed		Total (%)
	Yes (%)	No (%)	
OCD			
Yes	30 (20.69)	13 (52)	43 (100)
No	115 (79.31)	12 (48)	127 (100)
Total	145 (100)	25 (100)	

3.4 Group Differences

For this part of the analyses, data is presented for all participants who completed the study (N=145), those with OCD (N=30) and the comparison group (N=27) (see Tables 3.5 and 3.6). Those in the OCD group and comparison group were compared to gain information on the potential need to control for any differences between these groups in the main analyses. Independent sample *t*-tests were conducted to examine any potential differences between the OCD and comparison groups on continuous variables. Chi-squared analyses (χ^2), or Fisher's Exact Tests (FET) (when expected cell count was less than five) were conducted to examine any potential differences between the groups on categorical variables.

3.4.1 Analysis of group differences in socio-demographics. Table 3.5 shows descriptive statistics for the overall sample, as well as the two groups respectively, on socio-demographic variables. An independent samples *t*-test was used to explore any differences in age, between the OCD and comparison groups. Chi-square or Fisher's Exact Tests were used to explore any differences in the categorical socio-demographic variables. Again, these variables were collapsed where appropriate, as some numbers in individual groups were not large enough to produce meaningful results. Missing data was not included in the analyses. Findings demonstrate that there were no significant differences between the groups, in terms of demographic variables.

Table 3.5 Descriptive data and group differences (OCD and comparison groups) for demographic variables.

		Group			Independent samples t-test for group differences
		All (N=145)	OCD (N=30)	Comparison (N=27)	
		Mean [S.D]	Mean [S.D]	Mean [S.D]	
Age in years	Range	27.86 [12.13] 17-70	27.93 [11.19] 17-67	30.93 [12.17] 18-60	$t(55)=0.97, p=0.34$
		Frequency (%)	Frequency (%)	Frequency (%)	χ^2 /Fisher's Exact Test (<i>FET</i>) for group differences
Gender	Male	23 (15.86)	4 (13.33)	6 (22.22)	$p=0.32; FET$
	Female	120 (82.76)	25 (83.33)	21 (77.78)	
	Other/Missing	2 (1.38)	1 (3.33)	0 (0)	
Ethnicity	White British	98 (67.59)	20 (66.67)	23 (85.19)	$\chi^2(1)=2.63, p=0.09$
	Not White British	45 (31.03)	10 (33.33)	4 (14.81)	
	Missing	2 (1.38)	0 (0)	0 (0)	
Marital status	With partner	70 (48.28)	18 (60)	16 (59.26)	$\chi^2(1)=0.15, p=0.46$
	Not with partner	70 (48.28)	10 (33.33)	11 (40.74)	
	Missing	5 (3.45)	2 (6.67)	0 (0)	
Employment status	Working	58 (40)	11 (36.67)	18 (66.67)	$p=0.12; FET$
	Not working	17 (11.72)	5 (16.67)	2 (6.67)	
	Student	63 (43.45)	12 (40)	7 (25.93)	
	Missing	7 (4.83)	2 (6.67)	0 (0)	

		Group			χ^2 /Fisher's Exact Test (<i>FET</i>) for group differences
		All (N=145)	OCD (N=30)	Comparison (N=27)	
		Frequency (%)	Frequency (%)	Frequency (%)	
Highest Education level	Compulsory	3 (2.07)	2 (6.67)	0 (0)	$p=0.56$; <i>FET</i>
	Further	59 (40.69)	8 (26.67)	8 (29.63)	
	Higher	78 (53.79)	17 (56.67)	19 (70.37)	
	Missing	5 (3.45)	3 (10)	0 (0)	
Religion	No religion	89 (61.38)	22 (73.33)	17 (62.96)	$\chi^2(1)=0.71$, $p=0.29$
	Religion	54 (37.24)	8 (26.67)	10 (37.04)	
	Missing	2 (1.38)	0 (0)	0 (0)	

3.4.2 Analysis of group differences in psychopathology and use of

imagery. Table 3.6 shows descriptive statistics for the overall sample, as well as the two groups respectively, for the variables measuring psychopathology and imagery. Independent samples *t*-tests were used to explore any differences on these variables between the OCD and comparison groups. Results showed the two groups (OCD and comparison) to differ significantly on the HADS, OCI-R, YBOCS, but not to differ significantly on VVQ and SUIS. This showed the groups to be comparable in their use of imagery but, as expected, the OCD group had greater levels of psychopathology.

Table 3.6. Descriptive data and group differences (OCD and comparison groups) for psychopathology variables and use of imagery

	Group						Independent samples <i>t</i> -test
	All (N=145)		OCD (N=30)		Comparison (N=27)		
	Mean [S.D]	Range	Mean [S.D]	Range	Mean [S.D]	Range	
VVQ Total <i>Scale range 20-40</i>	25.48 [2.74]	21-32	25.50 [2.61]	21-32	24.96 [2.83]	21-31	<i>t</i> (55)=-0.75, <i>p</i> =0.46
VVQ Visual <i>Scale range 10-20</i> <i>Lower score= more visual cognitive style</i>	12.83 [1.93]	10-19	12.77 [1.65]	10-16	12.70 [2.33]	10-18	<i>t</i> (55)=-0.12, <i>p</i> =0.91
VVQ Verbal <i>Scale range 10-20</i> <i>Lower score=more verbal cognitive style</i>	12.64 [1.93]	10-18	12.73 [2.13]	10-17	12.26 [1.61]	10-16	<i>t</i> (55)=-0.94, <i>p</i> =0.35
HADS Total <i>Scale range 0-42</i> <i>Lower score = fewer symptoms of psychopathology</i>	14.24 [8.16]	0-38	23.43 [8.34]	7-38	8.62 [3.84]	3-20	<i>t</i> (41.72)=-8.74, <i>p</i> <0.001***
HADS Anxiety <i>Scale range 0-21</i> <i>Lower score = fewer symptoms of anxiety</i>	9.55 [4.92]	0-21	15.07 [3.77]	6-21	6.11 [2.28]	2-10	<i>t</i> (48.40)=-10.98, <i>p</i> <0.001***
HADS Depression <i>Scale range 0-21</i> <i>Lower score = fewer symptoms of depression</i>	4.69 [3.96]	0-19	8.37 [5.12]	0-19	2.52 [2.23]	0-10	<i>t</i> (55)=-5.12, <i>p</i> <0.001***

	Group						Independent samples <i>t</i> -test
	All (N=14 5)		OCD (N=30)		Comparison (N=27)		
	Mean [S.D]	Range	Mean [S.D]	Range	Mean [S.D]	Range	
OCI-R <i>Scale range 0-72</i> <i>Lower score=fewer symptoms of OCD</i>	20.85 [14.73]	0-62	38.70 [11.95]	21-62	5.78 [3.24]	0-12	$t(33.68)=-14.51, p<0.001^{***}$
SUIS <i>Scale range 12-60</i> <i>Lower score=lower imagery use</i>	37.96 [9.63]	13-59	39.97 [10.74]	18-59	36.81 [10.97]	13-55	$t(55)=-1.10, p=0.28$
Y-BOCS-SR <i>Scale range 0-40</i> <i>Lower score=fewer symptoms of OCD</i>	11.68 [9.98]	0-40	25.70 [6.91]	16-40	1.37 [1.74]	0-6	$t(30)=-19.55, p<0.001^{***}$
Y-BOCS-SR-COMP <i>Scale range 0-20</i> <i>Lower score=fewer compulsions</i>	5.06 [5.11]	0-20	12.27 [4.32]	1-20	0.52 [0.94]	0-3	$t(37.15)=-13.05, p<0.001^{***}$
Y-BOCS-SR-OBS <i>Scale range 0-20</i> <i>Lower score=fewer obsessions</i>	6.50 [5.25]	0-20	13.43 [3.47]	7-20	0.85 [1.06]	0-3	$t(42.95)=-17.51, p<0.001^{***}$

Participants were also asked whether they had ever had any other diagnoses of mental health conditions. Seventy percent of the OCD group said that they had in comparison to 14.8% of the comparison group. This difference between groups was statistically significant ($\chi^2(1)=18.77, p<0.001$), again indicating higher levels of psychopathology in the OCD group and raising the possibility that participants in this group had multiple current diagnoses. Participants were invited to describe any other mental health diagnoses they had received. The numbers of participants reporting each diagnosis are summarised in figure 3.1.

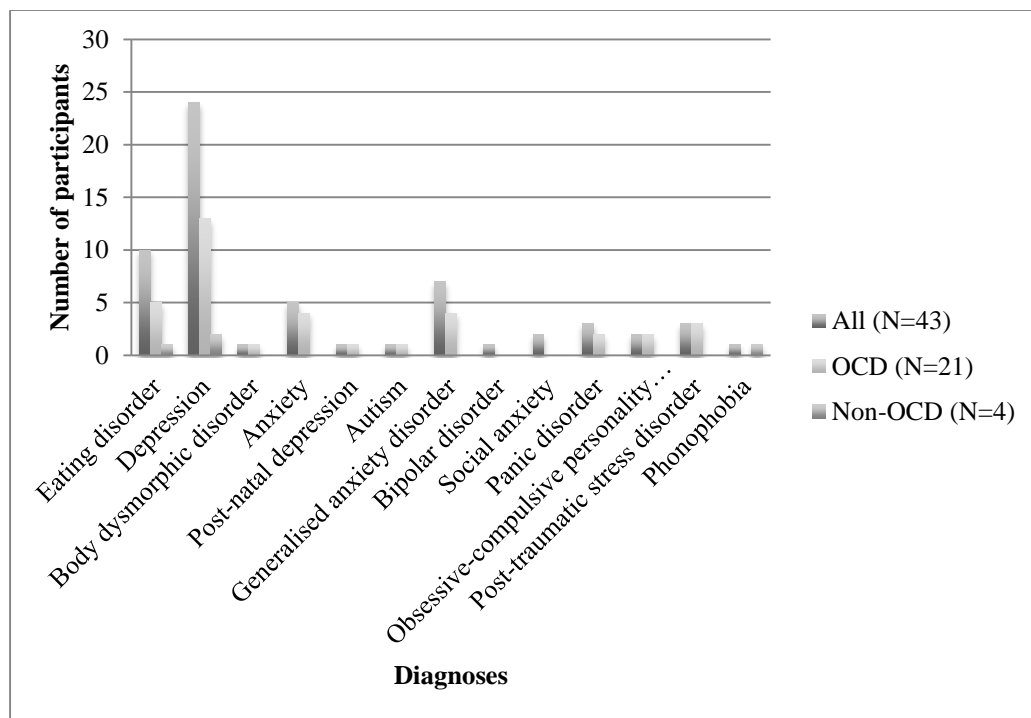


Figure 3.1. Self-report descriptions of additional mental health diagnoses.

3.4.3 Analysis of OCD group

Table 3.7 further describes the groups in relation to OCD. As expected, significantly more participants in the OCD group had a self-reported current ($\chi^2(1)=40.08, p<0.001$) as well as historical ($\chi^2(1)=37.31, p<0.001$) diagnosis of OCD. There were

also significantly more participants in the OCD group who had had treatment for symptoms of OCD ($\chi^2(1)=26.35, p<0.001$) and who were taking medication for anxiety ($\chi^2(1)=15.09, p<0.001$). All of these participants also had a score of or above 21 on the OCI-R and 16 on the Y-BOCS-SR.

Table 3.7 Psychopathology of OCD group

		Group	
		OCD (%) (N=30)	Comparison (%)(N=27)
Self-report current diagnosis of OCD	Yes	25 (83.33)	0 (0)
	No	5 (16.67)	27 (100)
	Prefer not to say	0 (0)	0 (0)
Historical diagnosis of OCD	Yes	24 (80)	0 (0)
	No	6 (20)	27 (100)
	Prefer not to say	0 (0)	0 (0)
Treatment for OCD	Yes	21 (70)	1 (3.70)
	No	9 (30)	26 (96.30)
	Prefer not to say	0 (0)	0 (0)
Medication for anxiety	Yes	15 (50)	1 (3.70)
	No	15 (50)	26 (96.30)
	Prefer not to say	0 (0)	0 (0)
Other mental health diagnoses	Yes	21 (70)	4 (14.81)
	No	8 (26.67)	24 (88.89)
	Prefer not to say	1 (3.33)	0 (0)

In summary, when looking specifically at differences between the group of participants completing the study and the group of participants not completing the study, results of the preliminary analyses showed no differences in demographics or variables measuring psychopathology. Diagnoses of OCD was the exception to this, with results suggesting fewer participants with a diagnosis of OCD to complete the

study, in comparison to what was expected. When looking at those completing the study, the OCD and comparison groups were analysed for any differences between these groups. Results showed no differences in regards to their demographic characteristics. In comparison to individuals in the comparison group, individuals in the OCD group showed greater levels of psychopathology. Specifically, a greater percentage of them had had additional diagnoses of mental health conditions, had had treatment for OCD and were taking medication for anxiety.

3.5 Main Analyses

3.5.1 Hypothesis One. OCD symptomatology will be associated with deontological judgements.

In order to test Hypothesis One, a Pearson correlation explored the association between OCD symptomatology, as measured by the OCI-R, and mean moral acceptability following each vignette. Lower mean moral acceptability scores indicated that the proposed action detailed in the vignettes was less acceptable to participants and indicated a more deontological response.

When looking at the whole sample and all vignettes, results showed a negative correlation between OCI-R and moral acceptability, that is, higher OCI-R scores were associated with lower mean moral acceptability ($r(139)=-0.19, p=0.02$). Due to the association between depression and deontological moral judgements (Valdesolo & DeSteno 2006) a partial correlation was used to explore the relationship between OCI-R and moral acceptability, whilst controlling for the possible relationship between these variables and depression as measured by the HADS depression subscale. Higher OCI-R scores remained significantly negatively associated with

lower mean moral acceptability ($r(138)=-0.18, p=0.03$). The effect size yielded ($r=0.18$) was small to moderate (Cohen, 1988).

As more exploratory analyses, the vignette types (Greene's and Mancini and Gangemi's) were also considered separately. When looking at Mancini and Gangemi's vignettes this result remained significant ($r(142)=-0.22, p<0.01$), even after controlling for depression ($r(138)=-0.22, p<0.01$; small to moderate effect size $r=0.22$). However, when looking at Greene's vignettes, whilst trends were in the same direction, the correlation was no longer significant ($r(140)=-0.14, p=0.10$; $r(138)=-0.11, p=0.18$ when controlling for depression).

These results were therefore in partial support of Hypothesis One, suggesting that greater OCD symptomatology is associated with more deontological moral judgements, after controlling for depression, particularly in relation to Mancini and Gangemi's moral dilemmas.

3.5.2 Hypothesis Two. People with OCD will make more deontological than utilitarian judgements, in comparison to those without OCD.

This hypothesis was tested in two ways, firstly using chi square analyses to explore differences between groups in regards to whether they felt they should carry out the proposed utilitarian action in the vignette and whether this would be morally acceptable. Secondly, this was tested using t -tests, which explored differences between groups in regards to participants' mean moral acceptability scores (*how morally acceptable they felt the action to be*).

In the OCD group, 106 out of 179 judgements were deontological equating to 59.22%. In other words, 59.22% of participants in the OCD group indicated that they would not choose to act according to the proposed utilitarian action. In the comparison group, 87 out of 162 judgements were deontological, equating to 53.70%. However this difference was not significant between groups (see Table 3.8). The effect size yielded ($\phi=0.06$) was less than ‘small’.

When participants were asked whether the utilitarian option was morally acceptable 108 out of 177 (61.02%) responses in the OCD group were ‘no’ and 68 out of 162 (41.98%) responses were ‘no’ in the comparison group. A Chi Square test shows that this difference was significant between groups (see Table 3.8) such that more individuals in the OCD group said that the action (utilitarian option) was not morally acceptable. This finding equates to a small to medium effect size ($\phi=0.19$).

Table 3.8. Descriptive data and group differences for Hypothesis Two

		Group		χ^2 for group differences
		OCD (%) (N=30; 180 decisions)	Comparison (%) (N=27; 162 decisions)	
<i>Should you/is it appropriate for you to [utilitarian option]?</i>	Yes	73 (40.56)	75 (46.30)	$\chi^2(1)=1.05, p=0.18$
	No	106 (58.89)	87 (53.70)	
	Missing	1 (0.56)	0 (0)	
<i>Would this be morally acceptable?</i>	Yes	69 (38.33)	94 (58.02)	$\chi^2(1)=12.29, p<0.001***$
	No	108 (60)	68 (41.98)	
	Missing	3 (1.67)	0 (0)	

Participants were asked to rate the moral acceptability of each vignette on a scale of one to seven. A lower number represented a more deontological judgement. Whilst the OCD group had a lower overall mean moral acceptability score than the comparison group (3.43 (S.D=1.37) and 3.83 (S.D=1.36) respectively), an independent samples *t*-test was carried out in order to ascertain whether group differences existed. The results showed this difference to be non-significant ($t(53)=1.10, p=0.28$). An analysis of covariance was used to control for the possible effects of depression, as measured by the HADS depression scale. After controlling for depression, the effect of the group remained non-significant ($F(1,52) = 0.12, p=0.73$).

Again, as more exploratory analyses, the vignette types were considered separately. There were no differences in the mean moral acceptability between groups when considering Greene's vignettes ($t(54)=0.50, p=0.62$), even after controlling for depression ($F(1,53)=0.16, p=0.69$). There were also no differences in the mean moral acceptability between groups, when considering Mancini and Gangemi's vignettes ($t(54)=1.58, p=0.12$), even after controlling for depression ($F(1,53)=1.21, p=0.28$).

These results therefore did not support Hypothesis Two. People with OCD did not make more deontological than utilitarian judgements, when compared to the comparison group, and this did not change across the vignettes. However, results of the overall sample did indicate that participants with more OCD symptomatology generally felt the utilitarian option was less morally acceptable than those without OCD.

3.5.3 Hypothesis Three. Imagery will mediate the relationship between OCD and moral judgements.

To evaluate the indirect effect of OCD symptomatology on moral judgements through imagery a number of mediation models were estimated using the PROCESS macro (Hayes, 2012), as an add on to SPSS. PROCESS is a regression-based tool for estimating direct and indirect effects. It uses bias-corrected bootstrapped confidence intervals of 1000 samples as standard and generates a sample of the distribution of the indirect effect. This is done by taking values from the original sample and resampling these 1000 times, after having replaced them, to produce estimate statistics (Hayes, 2009). The significance of the indirect effect is based on the 95% confidence interval and the indirect effect is deemed to be significant when the upper level confidence intervals (ULCI) and lower level confidence interval (LLCI) do not cross zero. When this is the case, statistical significance reaches the $p < 0.05$ level.

This approach is widely accepted in current psychological research and is growing in popularity. It was selected over the more traditional causal steps approach (Baron & Kenny, 1986) for a number of reasons including its increased reliability for detecting indirect effects (MacKinnon, Lockwood, Hoffman, West & Sheets, 2002), its consequent contribution to the reduction of type II error rates (Preacher & Hayes, 2008), its robustness to violations of normality (Hayes, 2012) and lack of prerequisite for the association between predictor and response variables (Mackinnon, 2008).

For these analyses, OCD symptomatology was measured using the OCI-R. Imagery was measured using one of three scales, in separate analyses: the VVQ Visual scale; SUIS (see Table 3.6 for descriptive statistics) and vividness (see Table

3.9 for descriptive statistics). Moral judgement was measured using mean moral acceptability scores, both for the vignettes together as well as Greene's and Mancini and Gangemi's vignettes individually (see Table 3.9 for descriptive statistics).

Table 3.9 Descriptive statistics for moral acceptability and vividness

	N=145	
	Mean [S.D]	Range
Moral Acceptability when considering both Greene and Mancini and Gangemi vignettes <i>Scale range 1-7</i> <i>How morally acceptable would this [utilitarian action] be?</i> <i>Lower scores represent lower moral acceptability i.e. a more deontological response</i>	3.39 [1.40]	1.00- 6.83
Moral Acceptability when considering only Mancini and Gangemi vignettes <i>Scale range 1-7</i> <i>How morally acceptable would this [utilitarian action] be?</i> <i>Lower scores represent lower moral acceptability i.e. a more deontological response</i>	3.84 [1.49]	1.00- 7.00
Moral Acceptability when considering only Greene vignettes <i>Scale range 1-7</i> <i>How morally acceptable would this [utilitarian action] be?</i> <i>Lower scores represent lower moral acceptability i.e. a more deontological response</i>	2.97 [1.59]	1.00- 7.00
Vividness when considering both Greene and Mancini and Gangemi vignettes <i>Scale range 1-7</i> <i>How vivid was the image?</i> <i>Lower scores represent lower vividness</i>	4.56 [1.61]	1.33- 7.00
Vividness when considering only Mancini and Gangemi vignettes <i>Scale range 1-7</i> <i>How vivid was the image?</i> <i>Lower scores represent lower vividness</i>	4.08 [1.44]	1.00- 7.00
Vividness when considering only Greene vignettes <i>Scale range 1-7</i> <i>How vivid was the image?</i> <i>Lower scores represent lower vividness</i>	4.56 [1.61]	1.00- 7.00

In the first analyses, the VVQ-Visual scale was used to measure the mediatory effect of a trait measure of visual preference. The effects of OCD symptomatology on imagery (path a), the effects of imagery on mean moral acceptability, partialling out the effect of OCD symptomatology (path b), and the direct effect of OCD symptomatology on mean moral acceptability after controlling for imagery (path c) are presented in Figures 3.2, 3.3 and 3.4. Path c', where OCD symptomatology predicts mean moral acceptability through imagery, is also represented. Coefficients for the models can be seen in Tables 3.10, 3.11 and 3.12 respectively. As in previous analyses, depression, as measured by the HADS depression subscale, was controlled for. Again the vignette types were analysed separately, in exploration of any potential differences between these. Therefore, the analyses were conducted with the overall moral acceptability, followed by that of Greene's and Mancini and Gangemi's vignettes separately.

Mediation model for overall moral acceptability.

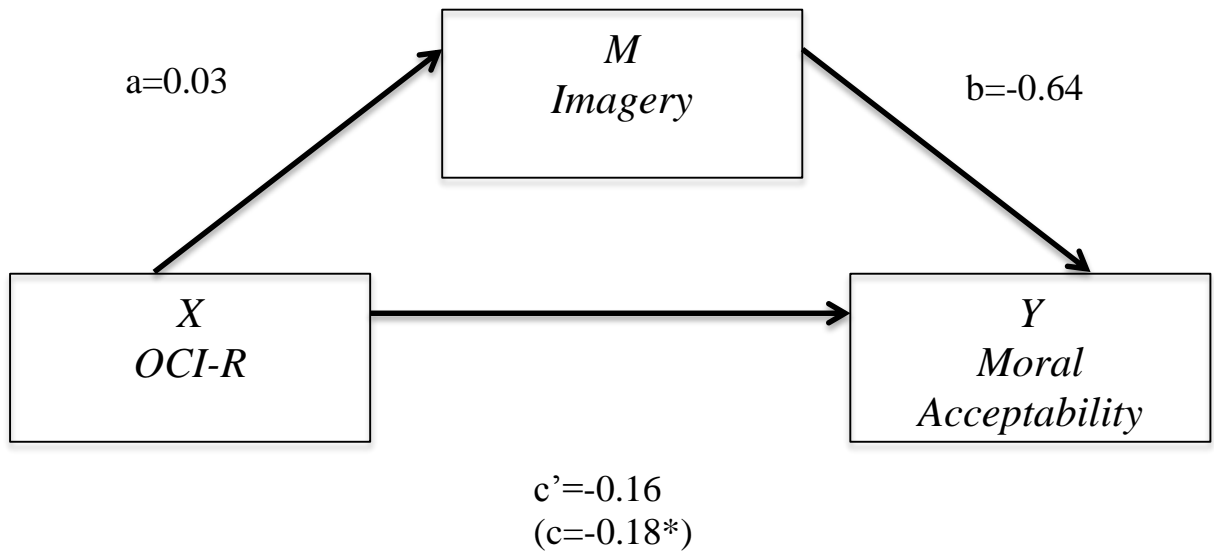


Figure 3.2. Mediation model for OCD symptomatology on moral acceptability via imagery

Table 3.10. Mediation model coefficients for OCD symptomatology on moral acceptability via imagery.

Antecedent		Consequence						
		M (VVQ VIS)			Y Moral judgement			
		Coeff.	SE	p		Coeff.	SE	p
X (OCI-R)	a	0.03	0.02	0.05	c'	-0.16	0.08	0.05
M (VVQ-VIS)					b	-0.64	0.44	0.15
Constant	i1	3.44	0.06	0.00	i2	6.31	1.54	0.00

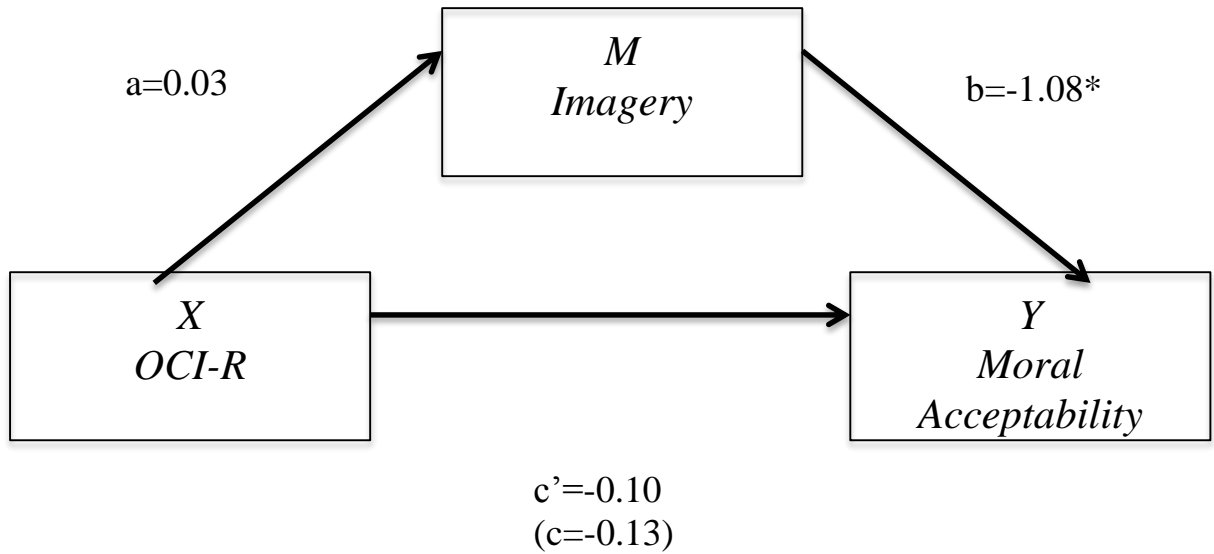
*p<0.05

Where SE=standard error, i1 and i2 = regression intercepts and coeff. = coefficient.

As Figure 3.2 and Table 3.10 illustrate, the relationship between OCD symptomatology and overall mean moral acceptability was not significantly mediated by imagery. The significance of the indirect effect (standardised indirect effect = -0.02) was tested using bootstrapping procedures. The bootstrapped unstandardised

indirect effect was -0.02 and the 95% confidence interval ranged from -.08 to .003 meaning the indirect effect with imagery as a mediator was not statistically significant. The mediator could account for only approximately 11% of the total effect.

Mediation model for Greene’s moral acceptability.



* $p < 0.05$

Figure 3.3. Mediation model for OCD symptomatology on Greene’s moral acceptability via imagery

Table 3.11. Mediation model coefficients for OCD symptomatology on Greene’s moral acceptability via imagery.

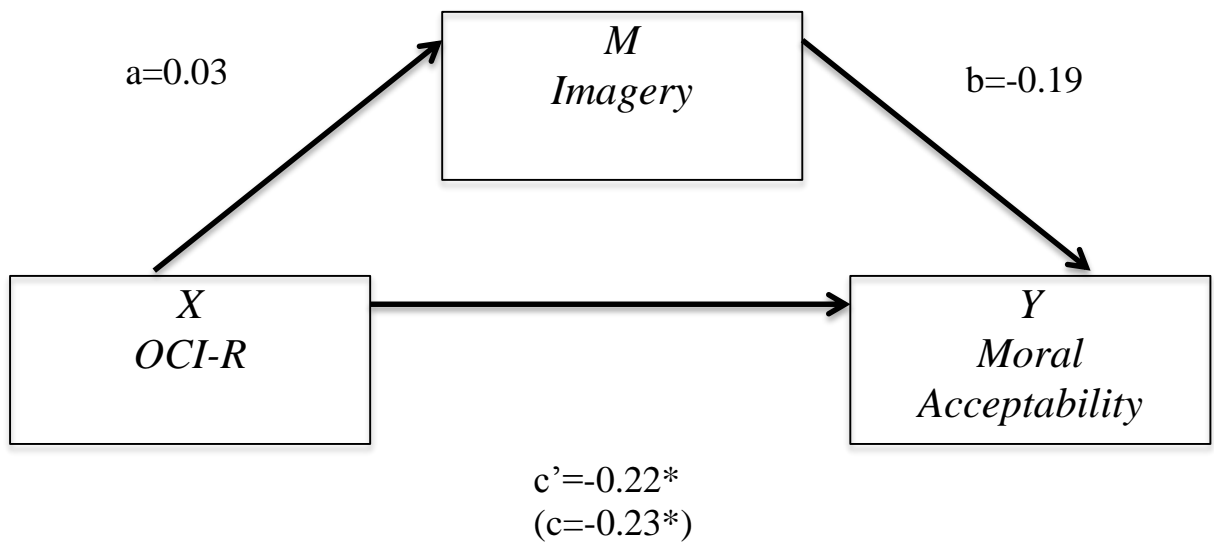
Antecedent		Consequence						
		M (VVQ VIS)			Y Moral judgement			
		Coeff.	SE	<i>p</i>		Coeff.	SE	<i>p</i>
X (OCI-R)	a	0.03	0.02	0.05	c'	-0.10	0.09	0.30
M (VVQ-VIS)					b	-1.08	0.50	0.03*
Constant	i1	3.44	0.06	0.00	i2	7.59	1.75	0.00

* $p < 0.05$

Where SE=standard error, i1 and i2 = regression intercepts and coeff. = coefficient.

Whilst there was a significant relationship between imagery and mean moral acceptability, the relationship between OCD symptomatology and Greene’s moral acceptability was not significant (in line with the results of hypothesis 2) and it was therefore not significantly mediated by imagery. This is illustrated in Figure 3.3 and Table 3.11. The significance of the indirect effect (standardised indirect effect = -0.03) was tested using bootstrapping procedures. The bootstrapped unstandardised indirect effect was -0.03 and the 95% confidence interval ranged from -.10 to .0003 confirming that the indirect effect with imagery as a mediator was not statistically significant. The mediator accounted for approximately 25% of the total effect.

Mediation model for Mancini and Gangemi’s moral acceptability.



$*p < 0.05$

Figure 3.4. Mediation model for OCD symptomatology on Mancini and Gangemi’s moral acceptability via imagery

Table 3.12. *Mediation model coefficients for OCD symptomatology on Mancini and Gangemi's moral acceptability via imagery.*

Antecedent		Consequence						
		M (VVQ VIS)			Y Moral judgement			
		Coeff.	SE	<i>p</i>		Coeff.	SE	<i>p</i>
X (OCI-R)	a	0.03	0.02	0.05	c'	-0.22	0.09	0.01*
M (VVQ-VIS)					b	-0.19	0.46	0.68
Constant	i1	3.44	0.06	0.00	i2	5.27	1.65	0.00

* $p < 0.05$

Where SE=standard error, i1 and i2 = regression intercepts and coeff. = coefficient.

The relationship between OCD symptomatology and Mancini and Gangemi's moral acceptability was not significantly mediated by imagery. This is illustrated in Figure 3.4 and Table 3.12. The significance of the indirect effect (standardised indirect effect = -0.006) was tested using bootstrapping procedures. The bootstrapped unstandardised indirect effect was -0.006 and the 95% confidence interval ranged from -.06 to .02 meaning the indirect effect with imagery as a mediator was not statistically significant. The mediator accounted for approximately 3% of the total effect.

The hypothesis was also tested using the SUIS and vividness of imagery associated with the vignettes, in place of the VVQ-Visual scale. In all of these cases, results of the mediation analyses were not significant ($p > 0.05$ in all cases as all confidence intervals crossed 0).

These findings suggest that Hypothesis 3 was not supported. Neither trait or state imagery mediated the relationship between OCD symptomatology and moral judgements. However exploratory analyses showed a relationship between imagery

and mean moral acceptability in relationship to Greene's vignettes. This suggested that imagery had a role in moral judgements.

4. Discussion

In this concluding chapter, the findings of the main results are summarised and then discussed in the context of previous research and existing theory. The strengths and limitations of the study are also discussed and suggestions for future research are made. Finally, the clinical implications of the study are outlined and the chapter finishes with some concluding remarks.

4.1 Aims

The study aimed to improve the understanding of moral judgements in individuals with OCD. In particular, the study looked at the type of judgements made by individuals with and without OCD, when presented with hypothetical scenarios involving moral dilemmas, and whether the presence of imagery is implicated in how these judgements are made. Based on findings from research by Franklin et al. (2009) and Gangemi and Mancini (2015), it was proposed that greater OCD symptomatology would be associated with more deontological moral judgements and that individuals with OCD, compared to individuals in a non-OCD comparison group, would make more deontological than utilitarian judgements. When considering the possible mechanisms of this relationship, it was proposed that visual imagery would have a specific meditational role, supporting deontological moral judgements over utilitarian moral judgements (Amit & Greene, 2012). This proposition was based on the fact that individuals with OCD often experience frequent and persistent imagery (Lipton et al., 2010) and so the finding that visual imagery supports deontological judgements would be amplified in these individuals.

4.2 Main Findings

4.2.1 Summary. The findings of the study were consistent with the hypothesis that there are differences between the moral judgements made by individuals with and without OCD. Specifically, it was found that OCD symptomatology was significantly associated with more deontological moral judgements. However, this was only the case when looking at Mancini and Gangemi's vignettes (the possible differences between these and Greene's vignettes will be discussed in more detail in section 4.2.2). That is, a greater presence of the symptoms of OCD was associated with making judgements based on the morality of the action involved and individual rights, rather than the overall consequences for the greater good, particularly in certain scenarios. In spite of this, the study did not find any significant differences between individuals with OCD and individuals in the comparison group, in regards to the number of deontological moral judgements they made. Although significantly more individuals with OCD felt that the option given to sacrifice fewer individuals, as a means to saving a greater number was not morally acceptable.

In spite of the association between OCD symptomatology and deontological moral judgements being present, particularly in relation to Mancini and Gangemi's vignettes, the current findings did not support the overall hypothesis that imagery mediated this relationship. This finding remained the same for all vignettes and both trait and state imagery use, suggesting no overall differences in the scenario or the type of imagery involved. However, when looking at the results in more detail, a relationship between trait imagery and moral judgements was found in relation to Greene's vignettes. In these vignettes, the use of visual imagery over verbal imagery was related to more deontological over utilitarian judgements. The non-significance

of the overall model showed that, although trait imagery was associated with deontological moral judgements, it did not mediate the relationship between obsessive-compulsive symptomatology and moral judgements. The results are discussed next, with respect to theoretical implications regarding Greene et al.'s (2004) dual process model and the findings of Amit and Greene (2012).

4.2.2 Theoretical understanding and implications of the current findings: the dual process model (Greene et al., 2004) and the role of imagery. In summary, the dual process model (Greene et al., 2004) proposes that deontological moral judgements are 'driven by automatic emotional processes' with utilitarian moral judgements being 'driven by controlled cognitive processes'. Amit and Greene (2012) investigated the differences in deontological and utilitarian judgements and indeed found that individuals with more visual cognitive styles made more deontological judgements, in personal moral dilemmas. They stated that this was due to the strong link between emotional salience and vividness of imagery (Mathews et al., 2013) and found the triggering of emotional responses by imagery caused individuals to visualise the harmful actions more than they were able to visualise the longer term benefits, when given a moral dilemma like the ones used in the current study. They suggested that this, in turn, caused individuals to make judgements that it would be better not to act to harm an individual, in spite of this action saving the lives of others. Amit and Greene (2012) defined a deontological moral judgement as one that favours the rights of individuals, as opposed to the greater good. It is made based on the quality of the action, rather than the overall outcome. It was therefore possible that, in individuals with OCD, the frequent and intense visual imagery they experience (De silver, 1986; Lipton et al, 2010) would cause them to imagine the potential harm they

would be causing. This would cause them to choose not to act to cause this harm and transgress a moral norm, even when this would mean saving a greater number. The findings of the current study did not support the hypothesis that the role of imagery found in Amit & Greene (2012) would be amplified. In fact, the finding that imagery was associated with deontological moral judgements was only found when looking at Greene's vignettes. That is, people with more visual imagery were more likely to make deontological judgements, only in relation to these vignettes.

Due to the differences in results across vignettes, they were explored in detail in order to identify any potential qualitative differences. It was identified that the actions in Greene's vignettes could be judged as involving a greater sense of personal agency and the individuals involved could be judged as being more vivid and vulnerable. For example, one of Greene's vignettes states 'To save yourself and the others *you must smother* your child to death' and involves more vulnerable individuals such as 'your baby', 'your oldest son' and 'your children'. This judgement was made in comparison to Mancini and Gangemi's vignettes (e.g., 'The only way you can prevent the death of the five patients *is to activate a ventilation system switch* that will divert the fumes into next room' and less vulnerable individuals such as 'three ill patients', 'three other workers' and 'three people'), which were based on the same original vignettes but seemed to portray the individual involved as having less agency over the action and individuals to be less vivid.

It is possible therefore that deontological moral judgements were only demonstrated in relation to Greene's vignettes as, possibly involving more agency and vividness, these were more likely to generate an image. In other words, it may be that the vignettes that involved less agency and were not as vivid were not sensitive to

visual imagery. This is in support of Greene et al., (2001), which suggested that moral judgements are more deontological in more personal moral dilemmas. It is also consistent with the dual process model (Greene et al., 2004), which highlights the link between emotional processing and deontological moral judgements, and in support of Amit and Greene (2012), which found imagery to support deontological moral judgements. However, these findings did not contribute to the understanding of the relationship between imagery and moral judgements, with obsessive-compulsive symptoms.

The results also showed symptoms of OCD to be associated with moral judgements made by individuals, particularly in Mancini and Gangemi's moral dilemmas. Specifically, symptoms of OCD were associated with individuals making more deontological moral judgements. That is, judgements in favour of individual rights and not transgressing moral norms in their actions. As results did not show imagery to mediate this relationship, alternative explanations for this finding will be discussed below. However, in considering the non-significant association between symptoms of OCD and moral judgements in Greene's vignettes, it is possible that the mechanisms around moral judgements in dilemmas depicting lower levels of agency and vividness are somewhat different to those in moral dilemmas involving more agency and vividness. As the trend of the results was in the hypothesised direction (greater symptoms of OCD were associated with more deontological moral judgements) it is possible that the strength of this mechanism was affected by the differences across vignettes. Alternatively, it is possible that Greene's vignettes were not realistic enough and did not represent every day concerns, changing the judgements made by individuals. This would be consistent with methodological

limitations raised in relation to Franklin et al. (2009) and these issues will be considered further in the limitations section below.

In summary, the results of the study showed that both OCD symptomatology and imagery are associated with moral judgements, but not through a mediatory relationship. Specifically, imagery did not mediate the relationship between OCD symptomatology and moral acceptability, but was associated with deontological moral judgements, in vignettes judged to depict more agency and vividness. In vignettes judged to depict less agency and vividness in their moral dilemmas, symptoms of OCD were particularly associated with deontological moral judgements. The finding that there are different outcomes between the vignette types suggests that moral judgements are sensitive to differences in the nature of vignettes and different mechanisms of judgement are made when vignettes are presented differently (i.e., when vignettes potentially involve more or less agency and vividness). This would support the findings of Greene et al., (2001) however conclusions around this are made tentatively as the nature of the vignettes was not directly tested or validated. In light of the associations between emotional processing, imagery and deontological moral judgements (Amit & Greene, 2012; Greene et al., 2004), future research could include a measurement of state emotion, in order to determine any differences between vignettes in this area.

When considering the relationship between OCD and moral judgements, and the lack of mediatory role on the part of imagery, it is possible that other explanatory factors such as the role of personal responsibility or deontological guilt can better explain their association. As they were not directly tested, firm conclusions cannot be

made. However, the findings suggest that they cannot be discounted and they will be therefore be considered next.

4.2.3 Theoretical understanding and implications of the current findings: alternative models. In light of the inconclusive relationship between imagery, OCD and deontological judgements, the association between OCD and deontological moral judgements is also considered in relation to alternative theories. These will be considered in turn and are posed as tentative explanations due to the risks associated with implying causation from correlational findings.

Heightened sense of personal over general responsibility. The association between symptoms of OCD and deontological moral judgements is consistent with the theory presented by Franklin et al. (2009). This proposed that the heightened sense of responsibility which individuals with OCD perceive themselves to have, especially in relation to situations involving potential harm (Rachman, 1993), causes them to make moral judgements that differ to those made by individuals without OCD. Franklin et al., (2009) proposed that increased levels of responsibility would either lead individuals with OCD to choose not to act to harm an individual (even in a situation where this would lead to saving the lives of many) so that they were not deemed to be personally responsible and did not transgress moral norms (deontological judgement). Alternatively they proposed that increased levels of perceived responsibility could lead an individual with OCD to make the decision to act to harm an individual, where this would prevent harm from occurring to a greater number (utilitarian judgement). This distinction can be seen as mirroring the distinction between specific appraisals of responsibility implying personal responsibility (e.g., I am personally responsible for my actions) and general

responsibility attitudes (e.g., ‘If I don’t act when I can foresee danger, then I am to blame for any consequences if it happens’ (Salkovskis et al., 2000; p1142), both found to be heightened in individuals with OCD (Salkovskis et al., 2000).

Although Franklin et al. (2009) did not find a significant association in their data, trends suggested that OCD symptomatology was more associated with making deontological moral judgements. That is, with making judgements in favour of individual rights and not transgressing moral norms (i.e., they choose not to act to harm an individual, as this would be wrong no matter what the consequences are on others). This suggested that an increased sense of personal responsibility could explain individuals feeling more responsible for their actions and not act to harm an individual, even when they could act to influence beneficial longer-term outcomes for a greater number of people. Whilst not significant, these theoretical grounds provide a basis for explaining the association between OCD and deontological moral judgements in the current study. It is possible that the reason for their non-significant findings was the methodological limitation around having a small sample size (N=18 and N=20 in the OCD and non-clinical groups respectively). The current study aimed to address this, having a sample of N=145 overall, N=30 in the OCD group and N=27 in the comparison group.

In addition to the investigation of associations between OCD and moral judgements, Franklin et al. (2009) also examined the proportion of scenarios for which their participants made deontological moral judgements. They found no differences in the number of deontological judgements made between individuals with and without OCD. The current study had similar findings, in that there were trends in the hypothesised direction (that individuals with OCD would make more

deontological judgements than those without OCD) but found no significant differences in the proportion of deontological judgements made by individuals with and without OCD (59.22% and 54.76% respectively in comparison to Franklin et al. (2009) who reported 55% and 46% respectively). Finding an association between OCD symptomatology and deontological moral judgements suggested that individuals with OCD would make significantly more deontological moral judgements than those without OCD. In spite of participants in the OCD group feeling the utilitarian action was less morally acceptable, this not being present in the current study indicates that the findings do not show a clear pattern. It may be that levels of personal responsibility were high enough to show an association in regards to Mancini and Gangemi's vignettes, but not high enough in the individual groups to show an effect. Cohen (1992) also suggests that, in order to obtain a power level of .80 and α of .05, 64 participants are needed in each group in order to obtain a medium effect size for a *t*-test. Therefore, in spite of the sample size being larger in the current study, this could remain a possible explanation for the lack of statistically significant difference between groups. As noted above, the role of responsibility was not directly tested in the current research, and although the findings are consistent with the model around personal responsibility leading individuals to make more deontological moral judgements no clear conclusions can be drawn regarding this mechanism as a means of moral judgements.

Omission bias. Beliefs and interpretations around responsibility are key factors in the CB model of OCD and individuals with OCD have been shown to experience heightened levels of personal responsibility, especially in relation to situations involving potential harm (Rachman, 1993). As noted above, Franklin et

al.'s (2009) proposal regarding the impact of responsibility was that an increased perception of responsibility leads to more deontological moral judgements. In contrast, other researchers have proposed the role of responsibility beliefs to show the opposite effect, when considering moral judgements in individuals with and without OCD. Specifically, researchers have proposed that beliefs about responsibility influence the role of omission bias (Wroe & Salkovskis, 2000) and transform situations such that individuals with OCD are more likely than individuals without OCD to act to prevent harm from occurring.

Omission bias is the phenomenon that harm resulting from action is perceived as less acceptable than harm resulting from inaction (Ritov & Baron, 1999). In this way, an action that results in harm may be perceived as less acceptable than failing to act to prevent harm. Wroe and Salkovskis (2000) found that individuals with OCD do not act in line with omission bias, when considering situations that are relevant to their OCD concerns. Their study concluded that, in such situations, a heightened sense of responsibility for potential harm led individuals with OCD to view the decision differently, feeling that failing to act to prevent harm is as bad as an action that results in the same harm, thus the decision to act to prevent harm.

Wroe and Salkovskis (2000) explained their findings to be the result of an individual experiencing an intrusive thought in relation to possible harm and a consequent appraisal of this intrusion that they are responsible for preventing it from occurring. The authors concluded that the occurrence of the intrusion and appraisal around responsibility means that actively 'doing nothing' to prevent harm actually becomes morally equivalent to 'doing something' that would have caused the harm and they therefore become equally as distressed, in both scenarios. This would

suggest that individuals with OCD are more likely to decide to act to prevent harm, that is, to choose the utilitarian action. The findings of the association between OCD and moral judgements in the current study support previous findings by Franklin et al., (2009), but are therefore in contrast to what may be expected from the findings from Wroe and Salkovskis (2000).

However, there are several important factors that should be considered when interpreting these findings. Firstly, Wroe and Salkovskis (2000) found that differences in the moral judgements of individuals with OCD were only present if their OCD concerns were activated. In other words, differences between individuals with and without OCD were found only in scenarios that were most relevant to their OCD concerns. Secondly, the research on omission bias has compared judgements regarding scenarios where harm occurs from either action or inaction and where the level of harm in each condition is the same. For example, Spranca, Minsk and Baron (1991) created a scenario where a tennis player wanted to beat an opponent by inducing him to eat cayenne pepper. He knew the house salad dressing contained cayenne, and planned to recommend it to his opponent. In one version, the opponent ordered it himself so the tennis player said nothing, in another version the tennis player recommended it. In this scenario, the outcome is the same; the tennis opponent will eat the cayenne pepper. In both Franklin et al.'s (2009) study and the current study however, inaction results in greater harm, and action results in lesser harm, to different people. So, in order to save the masses, an action must be made to fewer individuals. Thirdly, omission bias involves action/inaction and associated harm whereas the distinction between deontology/utilitarianism is considered more broadly,

being about the transgression of moral norms and the quality of actions versus overall consequences.

Omission bias in OCD has not yet been researched when both action and inaction result in different levels of harm, as was the case in the current study. Extending this principle, it may be expected that individuals without OCD judge it more acceptable not to act (deontological) and that individuals with OCD would not use this bias, and would therefore make a more utilitarian judgement, perceiving both action and inaction to be as bad as each other. Although Franklin et al. (2009) did not hypothesise a difference in any one direction the findings from their research would suggest that, in contrast to the proposal based on omission bias, individuals with OCD make more deontological judgements.

It is possible that the lack of difference in judgements between the two groups in the current study indicates that the omission bias was not found. This could have been because the vignettes were not specifically relevant to OCD concerns. In support of this, Wroe and Salkovskis (2000) found no difference between individuals with OCD and without OCD in their ratings of scenarios about which they were least disturbed, suggesting no differences in general decision making. Nevertheless, the findings of the current study cannot conclude that lack of omission bias can explain the differences in findings as, in order to do this, it would have been necessary to control for additional differences between the studies mentioned above. It would be of interest in future research, therefore, to control for the action principle (i.e., present scenarios in which both action and inaction result in the same amount potential harm and where action is not always associated with the utilitarian option) and to use vignettes that are of particular relevance to the OCD concerns of participants.

Furthermore, as Wroe and Salkovskis (2000) asked participants how they would act and the current study asked participants whether they should behave in line with the utilitarian action as well as the moral acceptability of this, it would be of interest to ask individuals to rate both hypothetical decisions as well as moral judgements of acceptability. It may be that decisions to act and the moral acceptability of this behaviour differ. This will be further explored later in this chapter.

Deontological guilt. The theory of deontological guilt (Mancini, 2008 cited in Gangemi & Mancini, 2011) can also be used to explain the association between symptoms of OCD and deontological moral judgements. A feeling of deontological guilt is triggered by transgressing a moral norm (Basile et al., 2013), for example, by injuring someone or committing incest, and generally occurs in the context of a social event (i.e., others are involved; Baumeister, Stillwell & Heatherton, 1994). It consists of an evaluation of an action as being wrong, feeling responsible for that action and the action not being in line with one's morals (Miceli & Castelfranchi, 1998). In contrast to the theory proposed by Wroe and Salkovskis (2000), Sustain (2005) suggests that not acting to harm an individual (and sacrificing the lives of a greater number) is in fact deemed to be generally better than acting to harm an individual (and saving the lives of a greater number) as this means intervening less in the 'natural order' of things, which is a moral transgression. This literature is relevant to individuals with OCD, who have not only been found to have heightened perceptions of responsibility, but who also have heightened feelings of guilt (Arntz, Voncken & Goosen, 2007).

As the work of Franklin et al. (2009) suggests, research has found individuals with OCD to feel particularly responsible for their own actions and the consequences

of their actions, as opposed to being particularly concerned about the welfare of others (Dettore, 2003 cited in Mancini & Gangemi, 2011). Deontological guilt arises as a result of transgressing moral norms and individuals with OCD, who are more sensitive to issues of morality (Bhar, 2004, cited in Doron & Kyrios, 2005; Clark & Purdon, 1993; Salkovskis, 1989), are therefore more inclined to avoid these feelings. This has been supported by empirical studies showing concern about a harmful event to be reduced if responsibility is assigned to someone else, even if the harmful event still occurs (Lopatchka & Rachman, 1995). Theoretically, this implies that individuals with OCD would have a greater preference for inaction and not engaging in a moral transgression than acting to prevent harm (as suggested by Wroe & Salkovskis, 2000), as this means avoiding feelings of guilt and personal responsibility.

Of note is that Mancini and Gangemi (2015) did indeed find significant differences such that individuals with OCD made significantly more deontological moral judgements in comparison to the other two groups. In contrast to the evidence discussed above, this suggests that individuals with OCD may make their moral judgements differently to individuals without OCD, even in situations that are not directly related to their OCD concerns. This was further confirmed by the induction of deontological guilt, by giving participants scenarios involving the transgression of a moral rule, leading to more deontological judgements (Mancini & Gangemi, 2015). However, a significant difference between the current study and Franklin et al. (2009) is that Mancini and Gangemi (2015) recruited their participants from small populations in specific regions of Italy that are strongly catholic. Previous authors (D'Olimpio & Mancini, 2014) have stated that guilt is commonly used as a motivator in education systems there and it is possible that their participants therefore had

heightened baseline perceptions of responsibility, which are further heightened in those with OCD. This could be an explanatory factor for the differences in their findings and would be in line with the prediction of Wroe and Salkovskis (2000) that heightened levels of responsibility moderates the relationship between intrusive thoughts and moral judgements.

In summary, the current study sought to examine whether individuals with OCD make more deontological than utilitarian judgements, in comparison to those without OCD. The results suggest that there is an association between these two factors, particularly in relation to Mancini and Gangemi's vignettes, and this could not be explained by the role of imagery. Therefore, other factors such as the heightened sense of personal responsibility and deontological guilt should be considered. Both theories involve personal responsibility, and this can therefore be seen as a strong explanatory model for the findings.

4.2.4 Summary of Theoretical Implications. The results of the current study suggest that OCD symptomatology is associated with deontological moral judgements, particularly in dilemmas that are judged to involve less agency and involve less vulnerable individuals. They also suggest imagery to be associated with deontological moral judgements, in dilemmas judged to involve more agency and more vulnerable individuals, but that this is independent of OCD. Although imagery was associated with more deontological judgements, it was not found to mediate the relationship between OCD and moral judgements and so the relationship between these variables is unclear. The association between imagery and deontological moral judgements, when more agency and vividness is involved, is in support of the dual process model (Greene et al., 2004) and the work of Amit and Greene (2012).

Whilst not directly tested, other models were considered as alternative explanations of the findings showing OCD symptomatology and deontological moral judgements to be associated. The findings of the current study are consistent with Franklin et al.'s (2009) proposal regarding the role of responsibility in the association between OCD and deontological moral judgements. Specifically, the findings are consistent with the proposal around the role of personal responsibility, as opposed to general responsibility, and also with suggestions that differences in decision outcomes are due to the unwanted guilt of transgressing moral norms (Mancini & Gangemi, 2015). The study has raised the possibility of different mechanisms of judgement being used in different moral dilemmas and this requires further exploration in order to confirm or disconfirm. The limitations of the study and suggestions for future research are presented below.

4.3 Strengths, Limitations and Suggestions for Future Research

This study brings together previous research on moral judgements in OCD and attempted to investigate the possible mechanisms behind the differences in moral judgements found in individuals with OCD. It has contributed novel information to the field as well as confirmed some previous findings. It is however important that the findings are considered within the context of the strengths and limitations of the study's methodology.

4.3.1 Design. The study employed a cross-sectional design that can be seen as cost and time efficient in comparison to other study designs such as case studies or monitoring populations over a significant period of time. However whilst cross-sectional designs allow the collection of data from a certain point in time, and can

therefore aid estimations of the frequency with which patterns occur (Levin, 2006), they cannot be used to gain information on causality between variables (Sedgwick, 2014), nor can they give information as to the sequencing of variables. In relation to the association between imagery and deontological moral judgements therefore, it is not possible to tell whether the imagery preceded the judgement or was elicited as a result of the judgement.

Furthermore, cross-sectional designs are vulnerable to response bias, whereby the characteristics of participants who choose to take part are not the same as those who do not, potentially resulting in a sample that does not represent the population being studied (Sedgwick, 2014). Whilst no differences were found between those individuals who started but did not complete the study it was not possible to collect information on those who did not start the study. The data should be interpreted cautiously, with these factors in mind. In spite of this, cross sectional designs are useful in identifying associations that can then be more investigated more thoroughly (Mann, 2003). Indeed, the current study highlights a number of avenues for further investigation.

4.3.2 Sample. When considering methodology around sampling, it is important to highlight that the study used a convenience sample (Baker et al., 2003), and benefitted from the advantages that this methodology facilitated. Whilst these benefits included cost and time efficiency, this meant that the sample was self-selected. There is evidence to suggest that education and affluence affects participation in online research, with more educated and affluent people taking part (Goyder, Warriner & Miller, 2002) as well as younger people (Moore & Tarnai, 2002) and white people (Voight, Koepsell & Daline, 2003). Furthermore, a high

proportion of the sample was female, and this is not representative of the equality with which OCD affects genders (OCD-UK, 2016). Women being more likely to access support (Vessey & Howard, 1993), and more generally prepared to take part in research than men (Moore & Tarnai, 2002), suggests they may have been more likely to encounter adverts for the study. This makes the study more vulnerable to bias and decreases its generalisability only to be relevant to other groups with similar characteristics (Graziano & Raulin, 1996), who have online access.

No differences were found between the OCD and comparison groups on socio-demographic variables, suggesting that the groups were well matched and the results found were unlikely to be a result of participants varying on these variables. However, 21 out of the 29 participants in the OCD group who chose to disclose whether they had ever had any previous diagnoses of mental health conditions stated that they had. This equates to 72.4%, in comparison to 14.3% of the comparison group. It is possible that participants had multiple current diagnoses and that, for those in the OCD group, these were secondary to their diagnosis of OCD. Although depression was controlled for in the study and this was the most commonly reported additional diagnosis, other mental health conditions (excluding diagnoses of psychosis, which was an exclusion criteria) could have had an impact on the results and this remains a potential confounding variable. Furthermore, there were five participants in the OCD group who did not report having a diagnosis of OCD. It is possible that they had never been diagnosed and they therefore represent a group who may have had very little psychological support. Nevertheless, as these participants met criteria for the OCD group through their scores on the OCI-R and Y-BOCS-SR,

they remained in the sample. This decision was made in order to maintain statistical power.

Lastly, the number of participants recruited to the current study was greater than the number recommended by the ‘a priori’ power calculation for the primary correlational analysis. This increases the likelihood that statistical analyses were able to detect any effects that were present and reduced the likelihood of a type II error occurring. However, the sample was also heterogeneous in nature and collected through a number of recruitment sites. The characteristics of the sample population could therefore be seen as broad and this was facilitated in order to recruit a large sample and provide as high a power as possible in analyses, within the time frame available. In spite of this, the heterogeneous sample can also be viewed as a strength of the study. OCD affects many individuals, regardless of gender, ethnicity, culture, religion or financial status and therefore affects a heterogeneous group of people (OCD-UK, 2016). Being recruited from various sites, the sample can be seen as more representative of the population with OCD, increasing its generalisability to the population of interest.

4.3.3 Vignettes. There are several limitations of the study, which concern the vignettes. Firstly, although previously used and validated in similar studies, there is little information in the source papers as to the validation process used to confirm the deontological/utilitarian constructs. Furthermore, the vignettes used in the current study were not specifically relevant to the OCD concerns of participants. fMRI research has shown neurological similarities in brain activation when individuals are presented with both everyday and hypothetical scenarios (Greene et al., 2004) however, as previously discussed, it is possible that individuals would answer

differently if vignettes described every day scenarios which depicted dilemmas that were relevant to the idiosyncratic concerns of individuals. To the researcher's knowledge, there are no existing published and validated vignettes, written in the style required, that are OCD relevant. It was not deemed feasible to develop, validate and use vignettes of this type within a DClinPsy research project therefore previously used and validated vignettes were utilised. This is an aspect of the study that could be usefully explored in future research.

Secondly, the vignettes all involved life threatening dilemmas and it is possible that all individuals would make the same decisions, in response to such scenarios (Franklin et al. 2009). This could go some way to explaining the lack of difference between groups and possibly the different findings in relation to Greene's vignettes, judged to involve more agency and vividness. In support of this, Foa et al., (2003) found that individuals with OCD took longer to make decisions in low-risk scenarios, when compared to high-risk scenarios. It may therefore be helpful to investigate reasoning about less dramatic moral dilemmas in order to determine whether this is a confounding factor. A further limitation of the interpretation of the vignettes, specifically the potential differences between them, is that these categories (agency/vividness) were determined by their qualitative features only and the distinctions are therefore made tentatively, due to them not having been formally validated as such.

Thirdly, the way in which the vignettes are written should also be considered. In line with previous research, the vignettes in the current study asked whether participants should act according to utilitarian principles, and whether this would be morally acceptable. It should be considered that participants' answers may not have

necessarily reflected an agreement with that principle, but a disagreement with the alternative option. Furthermore, vignettes used in studies in this area all involve acting in choosing the utilitarian option and not acting in choosing the deontological option. Whilst the conflict between deontological/utilitarian perspectives can be seen as a wider issue, involving the transgression of moral norms and the visualisation of the quality of the action rather than the overall outcome, it is possible that omission bias is confounding the overall results of such studies. It would therefore be of interest to replicate the study, whilst holding this constant. Future research may also include vignettes written from both deontological and utilitarian perspectives.

Fourthly, there is evidence to suggest that cognitive load affects moral judgments (Greene et al., 2008; Van't Veer, Stel & Beest, 2014), with it interfering with the formation of utilitarian moral judgements (Greene et al., 2008) and the ability to be dishonest (Van't Veer et al., 2014). This raises the possibility of the questionnaires preceding the vignettes acting as a cognitive load and interfering with the judgements made by participants in the current study. In order to reduce this, the study could have been conducted over two time points, with the questionnaires being completed at a different time to the vignettes. This was not included in the methodology of the current study, in order to avoid sample attrition, however this remains a consideration for future studies.

Finally, it is possible that differences in questioning could account for the conflicting results across studies. The analysis on the numbers of deontological/utilitarian decisions made was based on a question that asked 'should you/is it appropriate for you to [utilitarian action]' in a moral dilemma. The analysis on the moral acceptability of this action was based on a question asking 'would this

be morally acceptable'. It was assumed, in line with the theories of reasoned action (Ajzen & Fishbein, 1980) and planned behaviour (Ajzen, 1985), that people would act in a way that they intend and deem to be morally acceptable (Kant, 1959), and hence these questions are asking about a similar construct. However, there is evidence to suggest that this may not be the case and what individuals feel is more morally acceptable is not always aligned with the way in which they feel they should, and do act. For example, many individuals, both laypeople and medical practitioners, have views that euthanasia is morally acceptable however many fewer would act in accordance with these views, perhaps due to the laws in this area (Mitchell & Owens, 2004). Similarly, individuals with OCD often feel 'unfree' and choose to do things they do not want to do (de Haan, Rietveld, & Denys, 2015). Indeed, this was reflected in the current study, where the groups did not differ on their judgements as to whether they felt they should choose to act according to the proposed utilitarian action, but did differ as to whether they thought the proposed action was morally acceptable. It is possible that this may have differed still, if individuals were asked what they would do.

4.3.4 Missing data. The study recruited a large number of potential participants (N=269) however almost 50% of these did not progress to complete the study (N=145) and therefore were not used in the analyses. This kind of attrition can introduce bias if the people who do not complete the study are qualitatively different to those completing the study (Schulz & Grimes, 2001). Moher, Schulz and Altman (2001) recommend that demographic information is provided for all participants, both those who have completed and not completed studies, in order to analyse any potential differences between groups. Whilst there were no differences in available

data for those participants who withdrew during the questionnaires, vignettes or those who completed the study, making attrition bias less of a possibility (Miller & Hollist, 2007), it is worth acknowledging that, on the basis of OCI-R and YBOCS-SR scores, results indicated that having a diagnosis of OCD was associated with being less likely to complete the study. The difference in these two results may indicate a particular difficulty completing the study, particularly for those scoring in the clinical ranges. This may have been associated with the vignettes being particularly difficult for them to complete.

Missing data missing at random for those participants completing the study were imputed using Expectation Maximisation (EM). Due to missing data being small and missing at random, this was deemed to be an acceptable solution that minimised any bias arising from missing data (Scheffer, 2002). Unfortunately, it was not possible to use this method on missing data in the vignette variables and excluding them from analyses decreased the number of participants available for these analyses. This strategy is only valid when data is missing at random due to the risk of biasing the results (Shafer & Graham, 2002). However this was the case in the current study and suggests that employing this method did not have any adverse consequences on the results.

4.3.5 Measures. The study relied on the use of self-report measures, and was completed by participants individually, in an environment of their choice. Whilst this could be considered a strength of the study, and may have contributed to an increased rate of recruitment and elimination of the impact of unfamiliar surroundings distracting participants, Plous (1993) reported that self-report measures can lead to more socially acceptable rather than truthful responses, and therefore bias results.

There is a possibility that this occurred in the current study, particularly as participants were asked to make difficult decisions that resulted in death, albeit in hypothetical scenarios. Although precautions were taken to mitigate against this, such as ensuring the study would be completed anonymously and without the presence of a researcher, this should still be a consideration.

The measures selected for use in the study had good reliability and were well validated however the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon & Williams, 1996) is a ‘gold standard’ (Shear et al., 2000) diagnostic tool for the diagnosis of major DSM-IV diagnoses, such as OCD. It has reliability scores of between kappa = 0.40 (Skre, Onstad, Torgersen & Kringlen, 1991) and 0.70 (Zanarini & Frankenburg, 2001), for diagnoses of OCD and its validity is deemed to be superior to clinical interviews alone (Basco et al., 2000). Similarly to the methodology used in Mancini and Gangemi (2015) and Franklin et al., (2009), it would have been ideal to use the SCID in the current study, in order to establish diagnoses of OCD however due to the fact that it is clinician administered it was not deemed possible to use, in the context of a DClinPsy research project. This assessment tool would have compromised the anonymity of the participants and the additional time taken to administer and the follow up with a phone call or meeting may have meant that fewer participants would have been willing to take part.

4.4 Summary of Suggestions for Future Research

A number of suggestions for future research have been made throughout this chapter. For clarity, they will also be summarised next. In light of the differing levels of harm caused by both action and inaction in the vignettes used in both previous and the

current study, it would be of interest to control for these factors. This would mean presenting scenarios in which both action and inaction result in the same amount of potential harm as well as scenarios giving options both involving action or inaction. In further regard to the vignettes, future research could develop and validate moral dilemmas, which are specifically relevant to OCD concerns, with the view of activating these concerns for individuals and then analysing whether the moral judgements of individuals with OCD differ to those of individuals without OCD. Furthermore, future studies could employ the use of low-risk scenarios and real life dilemmas, in order to monitor any differences in the moral judgements of individuals with OCD, in relation to these and ensure that the responses are not affected by avoidable cognitive load. It would also be of great interest to look further at the qualitative differences between Mancini and Gangemi's and Greene's vignettes, in order to firmly establish any differences between them, and to study the effect of this on the moral judgements of individuals with OCD. This could include the measurement of any differences in state emotion elicited by the vignette types, for example by including an emotion wheel such as that developed by Scherer (2005).

4.5 Clinical Implications

The findings of the present study have a number of relevant clinical implications, which will be discussed next. CBT is currently considered to be the treatment of choice for OCD (McKay et al., 2015) and is therefore recommended in the guidelines of the National Institute for Health and Care Excellence (NICE, 2005). Over the years, the prognosis for those in treatment for OCD has improved significantly (Lack, 2012). However 30-40% of individuals still do not make clinically significant progress (Kulz & Voderholzer, 2011).

OCD is heterogeneous in its presentation (McKay et al., 2004) and it is common for it to present alongside other mental health problems (Abramowitz et al., 2008). In spite of its complexity, it is considered crucial that CBT is tailored to the idiosyncratic presentation of OCD (Wilhelm & Steketee, 2006) and it consequently now targets specific difficulties such as the interpretation and meaning of responsibility (Salkovskis, 1985), perfectionism (Pleva & Wade, 2006) and intolerance of uncertainty (Lind & Boschen, 2009). The findings of the current study advocate for the additional consideration of moral judgements in the treatment of OCD. They have implications, particularly within cognitive work, for the consideration of the type of moral judgements individuals make.

The findings of this study suggest that individuals with symptoms of OCD may make moral judgements differently from those without OCD, although conclusions regarding the specific mechanisms of these judgements cannot be made. Specifically, the findings suggest that increased OCD symptomatology is associated with making judgements that favour individual rights and focus on particular qualities of actions, rather than overall outcomes. Based on these results, psychological therapists may wish to consider building specific support on decision making, specifically in moral judgements, into their treatment protocols. For example, this could include specifically asking about how decisions are made, to elicit potential beliefs about responsibility or morality and make a judgement as to the extent to which individuals are able to think flexibly and consider the overall picture in a decision, as opposed to being limited to factors closest to them. Depending on the outcome, treatment may consider supporting individuals to gain greater psychological flexibility and build insights into overall, longer-term outcomes of their actions, bringing a more balanced

picture to decision making and supporting individuals to make informed decisions.

If, as the study suggests, OCD is associated with deontological judgements and, as Franklin et al. (2009) suggest, that this is mediated by heightened perceptions of personal responsibility then it may be of significant importance to assess for and incorporate work on assessing and gaining insight into responsibility. Methods to address guilt and responsibility interpretations have already been developed (Salkovskis, 1999; Van Oppen & Arntz, 1994) and challenging beliefs around and appraisals of responsibility may make it easier for patients to choose to engage or not to engage in compulsions.

Furthermore, it is possible that not transgressing moral norms is particularly important for individuals with OCD and this may contribute to their compulsive behaviours (Mancini & Gangemi, 2015). If this is the case, it may indicate the benefit of some focussed therapeutic work on morals. Specifically, this could include what individuals feel is right and wrong, how they feel if they do not behave in line with these morals and thinking about other perspectives alongside their costs and benefits. Research has shown early experiences and vulnerability to lead to negative self-evaluations in areas associated with morality (Doron et al., 2008) and individuals with OCD are often vigilant to intrusive thoughts, particularly those of a moral nature. Supporting individuals to become aware of these and manage any associated feelings of guilt or discomfort could be of benefit, as could a focus on weighing up the impact of a transgression of a moral rule, with the wider picture in view.

In summary, more targeted and tailored interventions, aimed at increasing psychological flexibility, could support individuals with OCD to have a greater

understanding of the judgements they make in moral dilemmas. This in turn could enable them to act, or not act, in ways that fit with their intentions, reducing the distress they experience from their symptoms. Indeed, a greater understanding of the underlying fears of individuals of OCD has been shown to lead to improved outcomes as therapeutic work can be more specifically tailored (Huppert & Zlotnik, 2012). More specific and successful treatments will therefore not only have important implications for clinical outcomes but also service-wide outcomes.

4.6 Summary

The results of the present study add to the literature on moral judgements in OCD. Specifically, they give additional support for OCD symptomatology being associated with making judgements about acceptability of action/inaction in favour of individual rights and not transgressing moral norms, at the expense of the greater good. This has implications for the decision-making process and hence initiation of compulsive behaviours. Significant differences were found between individuals with OCD and those without OCD feeling that the utilitarian option was morally unacceptable, with more individuals with OCD deeming it be to more unacceptable. If the assumption, generally accepted in the literature, that deontological and utilitarian decisions are on a continuum, with each being at either end, this result would go some way to further supporting the hypothesis that the individuals in the study with OCD were more inclined to make deontological decisions.

Given the association found in the study but the lack of clarity over the differences between OCD and comparison groups, it would be reasonable to conclude that further consideration is warranted in order to firmly establish whether individuals

with OCD make moral judgements in a way that is different to individuals without OCD. Whilst limited causal inference can be made from the current research, findings suggest that there may be some differences and it is concluded that the types of decisions individuals with OCD tend to make could beneficially be considered during psychological interventions, in order to support them to understand their decision making processes, and any biases they have in making these. Further to strong theoretical grounds in the literature, this study attempted to establish the impact the presence of imagery had on moral judgements. Whilst it was possible to determine a relationship between imagery and deontological moral judgements, this did not have a mediatory role in the relationship between OCD and deontological moral judgements. It may be prudent therefore to consider a heightened sense of personal responsibility, particularly in relation to the transgression of moral norms, to be a more reliable explanation for the findings however the study, nevertheless, raises suggestions for future research in order to further understand the mechanisms of moral judgements in individuals with OCD.

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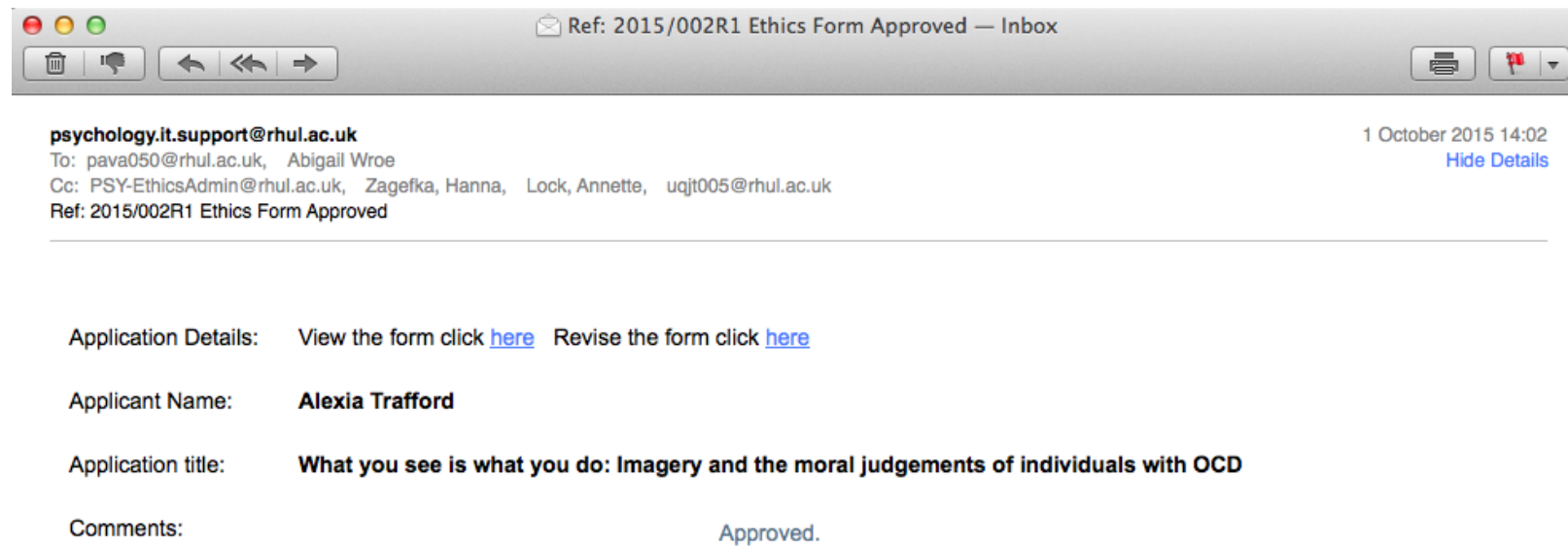
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6. Appendices

Appendix A: Ethical approval from the Royal Holloway, University of London Ethics Committee



Appendix B: Participant Information Sheet

Information Sheet

Moral Judgements

My name is Alexia Trafford and I am a research student at Royal Holloway, University of London. I am carrying out a study on the way in which we make moral judgements.

What is the purpose of the study?

Specifically, I am interested in learning about the similarities and differences between the ways in which people with Obsessive-Compulsive Disorder (OCD) and those without OCD make moral judgements. In order to do this, I would like to look at the similarities and differences in the moral judgements of as many adults as possible, whether they suffer from OCD or not. I would appreciate your participation, because a better understanding of how moral judgements are made could help us to gain a greater insight into compulsive behaviours associated with OCD.

What should I do if I would like to find out more?

If you wish to discuss any aspect of the research with me, please email alexia.trafford.2013@live.rhul.ac.uk. Alternatively, you can contact me by telephone on: 01784 414012. My study is being supervised by Dr Olga Luzon and Dr Abi Wroe. If you would like to discuss any aspect of the research with them, you can contact them by email at Olga.Luzon@rhul.ac.uk/Abigail.Wroe@rhul.ac.uk.

What will the study involve?

If you decide to take part, I will ask you to complete an online survey which will include some questionnaires and a series of moral dilemmas for you to read and answer questions on. This will take around an hour and further information about the study will be provided at the end.

Who will see my information?

Nobody except for myself and my supervisors will be allowed to see your answers. You will be known only by number so your answers will remain completely confidential. If the results of this study are published, any information you give will not be identifiable as yours.

Do I have to take part?

You do not have to answer all of the questions, if you don't want to. Similarly, you do not have to take part in this study, if you don't want to. If you decide to take part you may withdraw at any time without having to give a reason. You can also ask for your data to be destroyed. If you are a student at Royal Holloway, University of London, your decision about whether or not to take part will not affect your education in any way.

Please feel free to ask any questions before you complete the consent form below. Your consent will be stored separately from the anonymous information you provide for the research project. This study has been reviewed and approved by the Psychology department's internal ethical procedure at Royal Holloway, University of London.

Prize draw

Your participation will entitle you to enter a prize draw, where you will have the opportunity to win £50/£25 (not applicable to students gaining credits). You will also have the opportunity to receive information about the results of the study. If you wish to be entered into the prize draw, or to receive a summary of the results of the study, please provide your email address at the end of the study. Your email address will only be used for these purposes, and will be stored in a part of the database that is separate from other responses, so there will be no connection between your identity and your answers. Your email address will not be shared with anyone else.

What If There Is A Problem?

If you have a concern about any aspect of this study, please contact me, Alexia Trafford or my supervisors, Dr Olga Luzon or Dr Abi Wroe. We will do our best to answer your questions.

Appendix C: Example Participation Advert

Not included due to copyright restrictions

Appendix D: Participant Consent Form



You have been asked to participate in a study about moral judgements, which is being carried out by Alexia Trafford. Have you read the information about the study?

Yes

No

Have you asked any questions you wished to ask?

Yes

No

Have you got satisfactory answers to your questions?

Yes

No

Not applicable

Have you understood that you're free to withdraw from the study at any time, without giving a reason and without it affecting your education (if applicable)?

Yes

No

Do you agree to take part in the study?

Yes

No

Appendix E: Demographics Form

Demographics

1. What is your age?

2. What is your gender?

Male
Female
Other
Prefer not to say

3. What is your ethnic group?

White English/Welsh/Scottish/northern Irish/British
Irish
Any other white background

White & black Caribbean
White & black African
White & Asian
Any other mixed/multiple ethnic background

Indian
Bangladeshi
Pakistani
Chinese
Any other Asian background

African
Caribbean
Any other black/African/Caribbean background

Arabic

Any other ethnic group

Prefer not to say

4. What is your marital status?

Single
Married
With partner
Any other marital status
Prefer not to say

5. What is your employment status?

Employed
Unemployed
Retired
Student
Homemaker
Any other employment status
Prefer not to say

4. Do you have a diagnosis of Obsessive-Compulsive Disorder (OCD)?

Yes
No
Prefer not to say

5. Have you ever had a diagnosis of Obsessive-Compulsive Disorder (OCD)?

Yes
No
Prefer not to say

6. Have you ever had any treatment for symptoms of Obsessive-Compulsive Disorder?

Yes
No
Prefer not to say

7. Are you taking any medication to help with anxiety?

Yes
No
Prefer not to say

8. Have you had ever had any other diagnoses of mental health conditions?

Yes
No
Prefer not to say
If yes, please specify

9. What is your highest education level?

GCSE or equivalent
A-Level or equivalent
Bachelor's Degree level or equivalent
Master's Degree or equivalent
Doctoral Degree or equivalent
None of the above
Prefer not to say

10. What is your religion?

No religion

Christian (Including Church of England, Catholic, Protestant and all other Christian denominations)

Buddhist

Hindu

Jewish

Muslim

Sikh

Any other religion

Prefer not to say

Appendix F: Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)

Not included due to copyright restrictions

Appendix G: Verbaliser-Visualiser Questionnaire-Revised (Kirby et al.,1988)

Not included due to copyright restrictions

Appendix H: Obsessive-Compulsive Inventory-Revised (Foa et al., 2002)

Not included due to copyright restrictions

Appendix I: Spontaneous Use of Imagery Scale (Reisberg et al., 2003)

Not included due to copyright restrictions

Appendix J: Yale-Brown Obsessive-Compulsive Scale – Self-Report (Baer, 1991)

Not included due to copyright restrictions

Appendix K: Vignettes

Not included due to copyright restrictions

Appendix L: Participant Debrief Sheet

Debrief Sheet

Moral Judgements

Thank you for your participation in the study. Many people are interested in moral dilemmas and often enjoy thinking about what is right and wrong. For many years, philosophers and psychologists have conducted research in order to learn more about how people make judgements in moral dilemmas.

This study aims to contribute to this growing topic. Specifically, I am hoping that the study will help to gain a better understanding of how moral judgements are made in OCD and the mechanisms that might be used for these judgements. Some people think in a more visual way, some in a more verbal way. I am interested in the ways in which people think about decisions and how this might influence the decisions they make. I hope that the results will give greater insight into compulsive behaviours associated with OCD.

Some people find reading scenarios, such as the ones in this study, distressing and feel uncomfortable about answering questions on them. Some people can also be shocked or surprised at the decisions they make and what they think is morally acceptable might not be what they would actually do. If you felt uncomfortable or distressed and would like to access some support for this, or you would like some information on psychological wellbeing or OCD, details of organisations where you will be able to access this support are listed below:

- **Improving Access to Psychological Therapies (IAPT)** is a national NHS programme that provides support for depression and anxiety disorders. You can find your local IAPT service at www.iapt.nhs.uk
- **NHS Choices** provides information from the NHS on a range of conditions, treatments, local services and healthy living. You can access this online at www.nhs.uk
- **The Samaritans** are available 24 hours a day to provide confidential emotional support for people who are experiencing feelings of distress, despair or suicidal thoughts. They can be reached in a number of ways. For the fastest response, it is best to telephone them. Tel: 08457 90 90 90; Email: jo@samaritans.org; Web: www.samaritans.org.
- **Your GP** is able to provide information and support as well as make referrals to other organisations for specialist support.
- **If you are a student at Royal Holloway, University of London (RHUL)**, the RHUL student counselling services offer counselling sessions. You can arrange an appointment by calling them on 01784 443 128 or emailing them at counselling@royalholloway.ac.uk. Alternatively, you can go to office FW171 Monday-Friday 9am-12pm, 1pm-4pm to arrange an appointment in person.
- **IN AN EMERGENCY**, for example, if you feel you are at risk of harming yourself or you are experiencing suicidal thoughts, please visit your **local Accident &**

Emergency department.

Should you have any further questions or concerns, or wish to discuss any aspect of the study please contact alexia.trafford.2013@live.rhul.ac.uk

Appendix M: Details of Variable Transformations

Table 5.2. Transformations

Group	Variable	z scores		transformation	z-scores post transformation	
		skew	kurtosis		skew	kurtosis
Overall	VVQ-Visual	2.64	0.49	Square root	1.72	-0.76
	HADS Depression	5.93	1.82	Square root	-0.54	-0.69
	OCI-R	3.93	-0.28	Square root	0.17	-1.23
	YBOCS	5.03	0.86	Square root	-0.22	-1.31
Comparison Group	HADS Depression	3.49	2.09	Square root	-0.55	0.53
OCD Group	HADS Depression	0.57	-0.82	Square root	-2.05	0.92