**Passive and active Facebook use in adolescents: Impact on mood depending on level of social anxiety**

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**1. Executive Summary**

**1.1 Introduction**

- Social Networking Sites (SNS) have become increasingly popular since the advent of Facebook in 2004.

* Facebook remains the most visited social media platform with a total of 41 million internet users aged 13+.
* Adolescents are vulnerable to mental health difficulties and this, along with the prevalence of SNS use, has led to concerns about the impact on their wellbeing.
* Studies have mainly focused on adult populations, particularly undergraduate University students.

**1.2 The impact of SNS use on adolescents’ wellbeing: a systematic review**

**1.2.1 Background**

* Previous reviews, mainly in adults, have focused on specific outcomes, such as depression, with mixed findings. This systematic review considered a broader range of wellbeing outcomes associated with SNS use.
* This review may influence policies and guidance on the use of SNS, to promote and protect users’ wellbeing.

**1.2.2 Aim**

* To analyse existing quantitative studies on the impact of SNS use on adolescent wellbeing, to broaden our understanding of the potential impact on adolescent wellbeing.
* This research may inform future intervention and prevention research and may influence policies on social media use to support healthcare, education and parental guidance.

**1.2.3 Method**

* A systematic review of peer-reviewed published evidence was undertaken following the Preferred Reported Items for Systematic Reviews and Meta-analysis (PRISMA) Statement.
* Three bibliographic databases, Web of Science, Scopus, and Pubmed, were searched to identify relevant studies.
* Search terms included three key concepts; SNS, wellbeing, and adolescence.
* Inclusion criteria: quantitative studies with a primary focus on SNS use; a measure of wellbeing or psychological distress as the main outcome; adolescent participants with a mean age of <18; articles in English published between 2004 and 2019 to capture research on modern social networks.
* Exclusion criteria: studies that focused on general internet use; chat room use; private messaging only apps; video sharing platforms or online support forums; studies that referred to SNS as either an intervention delivery or SNS gaming; SNS addiction as the focus of SNS use.
* Data extraction items included participant characteristics, study characteristics and main findings: (i) authors and date of publication (ii) study design (iii) country recruited in (iv) recruitment (v) participant details (number/age) (vi) location (vii) SNS (viii) wellbeing outcome (ix) SNS variables (x) SNS measure (xi) wellbeing outcome (xii) outcome measure (xiii) summary of main findings (xiv) moderators/mediators.
* Eligible articles were assessed for risk of bias using the Quality assessment tool for observational, cohort and cross-sectional studies (NHLBI).

**1.2.4 Results**

* Electronic and hand searching identified 159 records. Duplications were removed and citations not meeting inclusion criteria were excluded, resulting in 16 citations included in the review.
* Of these, 13 were cross-sectional and 3 were longitudinal, with timescales from 6 months to 5 years. Mean age of participants was 15.44 years (range 10-26 years).
* There was a large amount of heterogeneity in the wellbeing measures used and in the aspects of SNS studied.
* There were mixed findings on the impact of SNS use on adolescent wellbeing.
* Results were grouped under relevant themes related to SNS use.
* Temporal aspects: There were more negative than positive outcomes associated with higher SNS usage.
* Types of SNS use (active and passive): Passive use, both on Facebook and Instagram was associated with negative impacts on wellbeing. The harmful impact of passive Facebook use occurred only in girls. Females benefited from active Facebook use, but only if they perceived social support, whereas boys experienced direct negative effects of active public Facebook use.
* Emotional aspects of SNS use: Where underlying attitudes or behaviours were more positive (such as depth of engagement, social support-seeking), the association tended to be beneficial. However, measures related to negative attitudes or behaviours (such as emotional dependence, emotional investment) revealed harmful associations.
* Communication aspects: Supportive online feedback, direct or perceived, is beneficial, whereas direct negative feedback is detrimental. Higher authentic self-presentation was associated with reduced depression.

**1.2.5 Discussion**

- This review highlighted that higher usage and passive use of SNS were more often associated with reduced wellbeing.

- The main findings need to be interpreted in the context of the methodological limitations.

- Most studies were cross-sectional so directions of causality between SNS use and wellbeing outcomes could not be determined.

- The use of convenience sampling may limit generalisability to adolescents from other locations and cultures.

- The self-report data collection methods raise the risk of information bias. Responses may also have been affected by a social desirability bias, given that some measures included emotional content.

- Future reviews would benefit from focusing on specific types of SNS use but further research is needed first.

- Future reviews should also consider exploring specific adolescent age ranges.

- There is scope for improvement in the reliability and validity of measures, particularly SNS use measures.

- Future studies could consider more objective data collection methods such as diaries, and SNS content analysis to provide more comprehensive information whilst reducing risk of bias.

- The relationship between SNS use and wellbeing appears multifactorial. Further research should include hypothesis-driven experimental designs if the elements are to be teased apart.

**1.3 Empirical Study: Active and passive Facebook use in adolescents: Impact on mood depending on levels of social anxiety**

**1.3.1 Background**

* Adolescents are vulnerable to mental health difficulties, including social anxiety, at a time when there is increased emphasis on the importance of social and peer relationships.
* Facebook provides an ideal platform to satisfy adolescents’ need to belong.
* Adolescents with social anxiety may have increased vulnerability to potentially negative consequences of Facebook use on mood.
* The cognitive model of social anxiety suggests that those with social anxiety will tend to use Facebook passively (browsing one’s newsfeed or others’ profiles, or searching for information about friends). Passive use may result in negative psychological consequences if adolescents compare themselves with others, in line with social comparison theory.
* Active Facebook use (interactions between the user and Facebook friends) may be beneficial for those with higher social competence according to the ‘rich get richer’ hypothesis, and also for those with lower social competence according to the ‘poor get richer’ hypothesis.
* If adolescents with high social anxiety usually use Facebook passively, as a safety behaviour, they might experience anticipatory anxiety if instructed to Facebook actively, thus experience reduced mood.
* The literature suggests that Facebook use can have positive implications on mental health when used to foster positive social interactions but detrimental effects when used passively for social comparison.

**1.3.2 Aim**

* To our knowledge there are no experimental studies that evaluate the relationship between high and low social anxiety, passive and active Facebook use and mood in adolescents. This experimental study aimed to evaluate this relationship.
* Hypothesis 1: Adolescents with high social anxiety will report more frequent passive Facebook use than those with low social anxiety.
* Hypothesis 2: Passive use of Facebook, but not active use of Facebook, will negatively impact mood in adolescents.
* Hypothesis 3: Passive newsfeed browsing will result in a greater increase in negative mood than passive social searching.
* Hypothesis 4: Adolescents with high social anxiety will experience a greater increase in negative mood than those with low social anxiety in the active use condition compared to either of the passive conditions.

**1.3.3 Method**

* The final sample was 98 secondary school students aged 13 to 18 years, recruited through convenience sampling. All participants had a Facebook account.
* Adolescents completed four self-report measures via Qualtrics Survey Software, as well as a ten-minute Facebook task.
* The Social Interaction Anxiety Scale (SIAS) was used to measure participants’ level of social anxiety, and the Positive and Negative Affect Scale (PANAS) was used to assess participants’ mood before and after the Facebook task. Participants’ usual use of active and passive features of Facebook was assessed using an adapted version of the Multidimensional Scale of Facebook use.
* Using cut off scores on the SIAS, participants were immediately allocated by Qualtrics to the ‘low’, ‘medium’ or ‘high’ social anxiety group, based on the recommended cut off score for social phobia, and then automatically assigned to one of the three Facebook task groups, either active use, passive browsing or passive social searching.
* Only participants in the low and high social anxiety groups were included in the analyses.
* Participants indicated which Facebook features they had actually used during the Facebook task, to assess compliance with the instructions.

**1.3.4 Results**

- An independent-samples t-test revealed no significant difference in mean active Facebook use score and mean passive use score between social anxiety groups. Thus, hypothesis 1 was not accepted.

* A three-way mixed ANOVA was conducted to understand the effects of social anxiety, active and passive Facebook use, and time on positive and negative mood scores separately. This analysis addressed hypotheses 2, 3, and 4. Contrary to expectations, there was no significant two-way interaction between Facebook condition and mood before and after the experimental task therefore hypotheses 2 and 3 were not accepted.

- There was no three-way interaction between social anxiety, Facebook condition and mood over time. There were no significant interactions between social anxiety and time, or Facebook condition and time, or social anxiety and Facebook condition. Hypothesis 4 was therefore not accepted.

* There was a main effect of time; positive and negative mood both decreased over time. There was also a main effect of social anxiety group; negative mood was significantly higher in those with high social anxiety compared to those with low social anxiety.
* Some participants did not use Facebook as instructed therefore secondary analyses using actual Facebook use instead of instructed Facebook use were conducted but these did not affect the findings for hypotheses 2, 3 and 4.

**1.3.5 Discussion**

* Results suggest that social anxiety may not be the strongest influence on adolescents’ usual use of Facebook nor on the impact of manipulated Facebook use on immediate mood.
* Possible influences may be the developmental need for connectedness in adolescents, or the preferential use of other SNS instead of Facebook in everyday life. Additionally, all adolescents may now use Facebook both actively and passively reducing the ability for outcome measures to differentiate between these.
* The balance of content in newsfeeds has recently changed from predominantly friends’ posts to memes and advertisements. This may limit adolescents’ opportunities for social comparison (which could reduce mood) on Facebook.
* Study limitations may also have affected the results: for example, small sample size, reliance on self-report measures, and lack of a control experimental condition.
* However, the reported decline in positive mood across all participants in our study may have more serious consequences for those with higher social anxiety thus future experimental research on social anxiety should investigate SNS use more widely, and mood should still be considered.

**1.4 Integration, Impact and Dissemination**

* Both the systematic review and the empirical study considered the impact of SNS use on adolescent wellbeing, though the review found that most published studies were correlational, questionnaire/survey therefore the empirical study filled a gap by using an experimental approach with an adolescent population.
* The review had a broad focus on SNS use and wellbeing, whereas the empirical paper narrowed the focus to Facebook, specific types of use, and mood, with social anxiety as an additional independent variable.
* Findings from the empirical study found that social anxiety did not influence the effect of type of Facebook use on mood. However, given that this study lacked the power to detect effects, but the review indicated such effects exist, further research is required.
* Both studies revealed limitations in the measures of SNS use.
* The research suggested that motivations for SNS use and the type of SNS use could affect the wellbeing outcomes. There may be gender differences in wellbeing outcomes.
* The findings could impact adolescents, parents, carers, health professionals and educators, through improving guidance on potential negative consequences of SNS use.
* Initial findings were disseminated via presentation to University trainees and findings will be summarised for participating schools and submitted for possible publication.

**2. The impact of SNS use on adolescents’ wellbeing: A systematic review**

**2.1 Abstract**

Social Networking Sites (SNS) have become increasingly popular since 2004 with a concomitant rise in research, mainly in adult populations, into their impact on wellbeing. Adolescents are particularly vulnerable to mental health difficulties but far fewer studies have investigated SNS’ impact on adolescent wellbeing. This systematic review brings together research in this area to inform potential guidance and intervention regarding SNS use. Studies were identified through a systematic literature search of three databases, Web of Science, Scopus and Pubmed. The inclusion criteria were quantitative studies, with a focus on SNS use and indicators of wellbeing as an outcome, in populations with a mean age of less than 18 years. The searches identified 16 eligible studies. The review revealed that there were both beneficial and potentially harmful effects of SNS use on adolescent wellbeing, yet direct comparisons between studies was difficult due to the heterogeneity of measures used and type of SNS use studied. Some key limitations included the reliance on self-report measures, the lack of validated SNS measures, and the mainly cross-sectional designs. Future research using longitudinal and experimental studies focused on types on SNS use and underlying motivations for use would be useful, to elucidate directions of causality and the mechanisms of the effects on adolescent wellbeing.

**2.2 Introduction**

**2.2.1 Social Networking Sites**

Online Social Networking Sites (SNS) such as Facebook, Snapchat, Instagram and Twitter, support social interaction, alongside providing opportunities for social comparison and peer feedback (Boyd & Ellison, 2007). SNS have become increasingly popular, with nearly 80% of internet users reporting SNS use, and it accounts for 25% of the total time spent online (Comscore, 2011). Their popularity is particularly evident amongst adolescents (Lenhart, 2015; Statista, 2017). In the UK 90% of 16-24 year olds have reported using SNS (Pew Research Centre, 2017) and an average 15-16 year old spends 118 minutes per day online (O’Neill, Livingstone, & McLaughlin, 2011). Facebook is considered the most popular SNS (Lenhart, 2015), and of the estimated 81% of adolescents aged 12-17 years old who use SNS, 94% have a Facebook profile (Madden et al., 2013).

**2.2.2 Wellbeing**

Leckey (2011) defined wellbeing as the extent to which people feel they can realise their own abilities, cope with the normal stresses of life, work productively toward their goals, and contribute to their communities, whereas Hunt and McKenna (1992) stated it is an individual’s subjective measure of one’s quality of life and absence of psychological distress. The terms “subjective wellbeing”, “psychological wellbeing”, and “wellbeing” are often used interchangeably within the literature. Research studies have included components of life satisfaction, positive and negative affect (Best, Manktelow, & Taylor, 2014), with depression, loneliness and self-esteem often included as indicators of psychological wellbeing (Seabrook, Kern, & Rickard, 2016). Considering that there is no agreed definition of wellbeing in the literature, for the purpose of this review wellbeing has been conceptualised in the hedonic sense (Best et al., 2014) which includes common indicators of positive and negative affect such as depression and anxiety.

**2.2.3 Adolescence**

During adolescence mental health problems may emerge (Kessler et al., 2005). Depressive symptoms dramatically increase (Natsuaki, Biehl, & Ge, 2009) with 18.2% of early adolescents (Saluja et al., 2004) and 28.6% of seventh to twelfth grade students (Rushton, Forcier, & Schechtman, 2002) reported to have depressed mood. According to the 2017 Children’s Mental Health Report, nearly one in three adolescents will meet criteria for an anxiety disorder by the age of 18 (Child Mind Institute, 2017). Important developmental and psychological changes also occur during adolescence, alongside educational, social (Steinberg & Morris, 2001), and sexual pressures (Russell, 2005). In adolescence, individuals are developing a sense of self, and through exploring identity, individual differences may lead to peer bullying, reported by over half of adolescents (Wang, Ionnotti, & Nansel, 2009) thus increasing the risk of low self-esteem, depression (Brown & Larson, 2009) and suicide attempts (Kim & Leventhal, 2008; Vander Stoep et al., 2011). Supportive friendships become increasingly important for adolescents’ psychological development (Manago, Taylor, & Greenfield, 2012). Social relationships become more complex, social status becomes more important (Brown & Larson, 2009), and peer relationships gradually displace parental relationships (Ophir, Asterhan, & Schwarz, 2019). Peer friendships increase adolescents’ perception of emotional support (Bokhorst, Sumter, & Westenberg, 2010), which may increase wellbeing (Oh, Ozkaya, & LaRose, 2014) and thus protect against depression (Rueger, Malecki, & Demaray, 2010). SNS offer opportunities for adolescents to widen social networks, build social capital and seek social support. Social support-seeking seems to be a common adolescent coping strategy (Zimmer-Gembeck & Skinner, 2011) and maintaining relationships with peers is an essential component of their positive wellbeing (Carroll et al., 2014).

Technological advances and SNS’ popularity have substantially changed how adolescents communicate, expanding peer interactions into an online context (Reich, Subrahmanyam, & Espinoza, 2012). Adolescents use SNS for self-presentation purposes and for emotional self-disclosure (Manago et al., 2012; Ophir, 2017), and for increasing their popularity and self-image (Zywica & Danowski, 2008). In line with the uses and gratification theory, researchers suggested that people actively choose to use SNS to meet psychological and sociological needs (Diddi & LaRose, 2006). The main common motive for SNS use was maintaining existing social networks (Boyd & Ellison, 2007). Different gratifications on SNS may have different psychological effects; for example, entertainment and socialising may contribute to improved mood states (Apaolaza, He, & Hartmann, 2014), and sharing and seeking information on Facebook can reduce stress (George, Dellasega, Whitehead, & Borden, 2013). Socially competent individuals use SNS primarily to maintain existing relationships, whereas socially isolated individuals use SNS to initiate new relationships (Lee, 2009). Online communication allows users to control what they present, and when and how to respond to others (Walther, 1996). The control over self-presentation (Caplan, 2005) lets adolescents present the most positive aspects of their identity (Manago, Graham, Greenfield, & Salimkhan, 2008). This control (Trepte & Reinecke, 2012), and the privacy options (Holleran, 2010) can lead to greater self-disclosure and intimacy (Nguyen, Bin, & Campbell, 2012; Tidwell & Walther, 2002) which can enhance friendships (Lenhart & Madden, 2007; Valkenburg & Peter, 2007a;). Although reduced contextual, visual, auditory and non-verbal cues can be helpful for self-disclosure online, this may limit effective emotional support-seeking through reduction of cues available to the users’ contacts (Frison & Eggermont, 2015a), yet make communicating more comfortable for those with poor social skills or social anxiety (McKenna & Bargh, 2000). Adolescence is also a period of identity formation (Subrahmanyam & Smahel, 2011), which can be influenced by the ability to control self-presentation on SNS. Individuals may choose to disclose more intimate information on private messenger on Facebook, rather than through the more public SNS features (Utz, 2015), but the latter can reach larger audiences, increasing the frequency of supportive feedback (Bazarova, Choi, Schwanda Sosik, Cosley, & Whitlock, 2015).

**2.2.4 Linking SNS use and wellbeing**

The increase in diagnoses of adolescent mental health conditions in the UK mirrors the growth of SNS use, suggesting that the two may be linked (O’Keeffe & Clarke-Pearson, 2011), especially as teenagers are particularly vulnerable to potential detrimental consequences (Daine et al., 2013). Research on the impact of SNS use on wellbeing have been mainly cross-sectional, and there is lack of clarity regarding the directionality of the link between SNS use and wellbeing. Findings present a mixed picture regarding whether SNS use is beneficial or a risk factor. Studies in young adults, on time spent on SNS, have revealed beneficial associations with life satisfaction (Valenzuela, Park, & Kee, 2009) and self-esteem and loneliness (Burke, 2013), whilst other studies showed no associations (Lee, Lee, & Kwon, 2011; Simoncic, Kuhlman, Vargas, Houchins, & Lopez-Duran, 2014). Researchers report potentially harmful associations between SNS use and aspects of wellbeing such as depression in high school students (Pantic et al., 2012) and young adults (Steers, Wickham, & Acitelli, 2014), life satisfaction in young adults (Blachnio, Przepiorka, & Pantic, 2015; Kross et al., 2013), self-esteem (Kalpidou, Costin, & Morris, 2011), and loneliness in undergraduates (Lemieux, Lajoie, & Trainor, 2013), and psychological distress and suicide ideation in adolescents (Sampasa-Kanyinga & Lewis, 2015). In support of these findings, a recent cohort study by Kelly, Zilanawala, Booker, and Sacker (2018) revealed a negative impact of time spent on depression in adolescents. Other researchers have found a positive relationship between number of friends, perceived social support, and wellbeing in undergraduates (Kim and Lee, 2011; Lee et al., 2011; Manago et al., 2012; Nabi, Prestin, & So, 2013) and adults (Oh et al., 2014). Possible mediators for this positive association have been reported, such as self-disclosure and friendship quality (Wang, Jackson, Gaskin, & Wang, 2014), although Kim and Lee (2011) found that this relationship was not mediated by perceived social support. In addition to findings related to use of SNS, an individual’s level of emotional investment in SNS, which measures how important the SNS is to the user, has been linked to harmful effects on wellbeing in undergraduates (Manago et al., 2008).

Some researchers have studied patterns of usage, such as active and passive use. Active use refers to interactions between the user and Facebook friends, whereas passive use includes viewing others’ profiles (Frison & Eggermont, 2016a). Cross-sectional studies have revealed that passive use may reduce wellbeing (Chen, Fan, Liu, Zhou, & Xie, 2016; Krasnova, Wenninger, Widjaja, & Buxmann, 2015; Kross et al., 2013) whereas active use may improve wellbeing (Kim & Lee, 2011). A review by Verduyn, Ybarry, Resibois, Jonides, and Kross (2017) proposed that active use may positively influence wellbeing. This has been supported by Burke, Marlow, and Lento (2010) and in an experimental study by Deters and Mehl (2013); both in adults. Other experimental research in adults has supported a link between passive use and reduction in wellbeing indicators (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015; Sagioglou & Greitemeyer, 2014; Verduyn et al., 2015). Similarly, passive Instagram use was associated with worse mood in female undergraduates (Brown & Tiggeman, 2016), yet also with reduced loneliness among university undergraduates (Yang, 2016).

Considering indicators of wellbeing, studies have found SNS use to be positively associated with depression in high school students (Pantic et al., 2012) and older adolescents (Jelenchick, Eickhoff, & Moreno, 2013), and with psychological distress (Chen & Lee, 2013; Fardouly et al., 2015) and lower self-esteem (Kalpidou et al., 2011) in undergraduates. Additionally, SNS use has been linked with body image concerns in female undergraduates (Fardouly & Vartanian, 2015), and anxiety in adolescents (Labrague, 2014) and undergraduates (Farahani, Kazemi, Aghamohamadi, Bakhtiarvand, & Ansari, 2015). However, other studies found a negative association between SNS use and depression in undergraduates (Park, Lee, Kwak, Cha, & Jeong, 2013; Rae & Lonborg, 2015), and anxiety in adults (Grieve, Indian, Witteveen, Tolan, & Marrington, 2013), whilst other studies have found no association between SNS use and depression in high school students (Banjanin, Banjanin, Dimitrijevic, & Pantic, 2015) and both depression and anxiety in young adults (Feinstein, Bhatia, Hershenberg, & Davila, 2012). Increased frequency of supportive feedback may explain some positive impacts on wellbeing (Burke & Kraut, 2016) and one possible reason for a link between SNS use and negative indicators of wellbeing is that SNS can be used as platforms for cyberbullying, increasing the likelihood of harassment, criticism, and social exclusion (Dempsey, Sulkowski, Nichols, & Storch, 2009; Subrahmanyam & Greenfield, 2008). This review will provide information on possible mechanisms underlying SNS use and its’ impact on wellbeing.

**2.2.5 Aim of this review**

Prior research showed SNS use to be both beneficial and detrimental to wellbeing. The focus of this review was to evaluate the research to date, to better understand these discrepancies. In this review the term ‘wellbeing' included a variety of related concepts, taking a broader approach than a recent systematic review by Frost and Rickwood (2017) that exclusively focused on psychological symptoms of diagnosable mental illness associated with Facebook use, in both adults and adolescents. Marino, Gini, Vieno, and Spada (2018), in adolescents and adults, explored problematic Facebook use. Potential wellbeing issues are widespread and therefore this review sought to consider more general SNS use, which adds to the complexity of interpretation, but should broaden our understanding of the potential impact on adolescent wellbeing.

Much of the previous work has been with adults, particularly University students (Manago et al., 2012; Best et al., 2014). This review therefore focused on adolescents, using studies with mean participant age below 18, to understand possible conclusions that can be drawn regarding SNS use in this age group, a generation that has grown up in an age of digital communication. From a psychological public health perspective, such research may inform future intervention and prevention research and may influence policies on social media use to support health care, education and parental guidance in line with recent UK government aims in this field (Royal Society for Public Health, 2017).

**2.3 Method**

**2.3.1 Methods for reviewing efficacy**

The Centre for Reviews and Dissemination guidance for undertaking systematic reviews, and the Preferred Reporting Items of Systematic reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009) were used to inform the methods and reporting of this systematic review.

**2.3.2 Search strategy**

A structured search strategy was developed using a PICOT framework to first identify relevant terms to be used for the searches, followed by a systematic search technique to retrieve relevant articles. The academic databases Web of Science, Scopus and Pubmed were chosen as these were considered larger databases that covered a wider subject area. Web of Science and Scopus are the largest multidisciplinary databases that cover all the subject areas, therefore given that the research question was broad and interdisciplinary, these three databases were relevant to capture the different studies across the range of disciplines. Additionally, Pubmed and Scopus contain APA psychology journals and therefore would identify relevant Psychology studies in this area. Search terms were chosen to capture the multiple ways that the key concepts are defined in the existing literature, including studies with their outcome measures defined as ‘wellbeing’ and those with outcomes linked to positive and negative affect such as depression and anxiety, or psychological distress. Initial scoping exercises were carried out to trial and refine search terms according to their results. Search terms were identified to include the three key concepts of SNS (“social media”, “social network\*”, “Facebook”, Twitter”, “Instagram” and “Snapchat”), wellbeing ("wellbeing”, "well-being", "well being", "mood", "psychological distress\*", "depress\*", "anx\*", "affect") and adolescence (“adolescen\*”, “teen”, “youth”, “young person”, “young people”). The Boolean operator OR was used between these search terms within each set of brackets whilst the Boolean operator AND was used to combine the three main concepts.

**2.3.3 Inclusion criteria**

All included articles had to focus on the impact of online SNS, used primarily for social interaction, on adolescent wellbeing. We used the conceptualisation of SNS by Ellison and Boyd (2013) to define SNS as sites that are web-based communication platforms with 3 distinct characteristics: (1) user profiles are unique and created through user-provided content and content provided by other users; (2) the network connections between individuals are visible and can be navigated through by other users; and (3) individuals can broadcast content and consume and interact with content contributed by others in a continuous stream of information. Studies were included if they had a primary focus on SNS use as a behaviour or attitude.

Eligible studies had to include a measure of wellbeing or psychological distress as the main outcome. This review focused on psychological wellbeing in its widest sense; it therefore includes research into particular conditions, such as depression and anxiety, as many studies in this area have adopted broad definitions of mental health. The search was limited to articles published between 2004 and 2019 as Facebook was launched in February 2004 followed by other social networking sites such as Instagram, Twitter and Snapchat. The time period hoped to capture research on the main SNS that all share the basic features of modern social networks. Articles were only included if the adolescent sample had a mean age below 18, thus allowing studies to be included where some participants may be older than 18 years of age. This age limit was chosen due to there being considerable research in young adults (aged 18 and over) whereas very little research has been done in younger populations. Additionally, different life transitions are occurring at 18 and older (e.g. university, moving out of home), whereas adolescents below 18 are predominantly still attending school and experiencing similar developmental and generational vulnerabilities. Whilst most SNS have a minimum user age of 13 (e.g. Facebook, 2018), these age restrictions are commonly violated as few sites require validation of age. Livingstone, Olafsson, and Staksrud (2011) reported that 25% of European 9-11 year olds, and 50% of 11-12 year olds have their own profile on a SNS. Thus, studies were not excluded if their age range included those below 13 years. As there was no translation resource, only studies in English language were included. Articles were not excluded by country of origin if they were available in English. Additionally, articles were restricted to publication in peer-reviewed journals, and to those which used quantitative methods which allow for exploration of associations. Within this emerging field, both quantitative and qualitative, as well as mixed methods approaches have been used (O’Reilly et al., 2018; Weinstein, 2018). There has been qualitative research in both adults and adolescents in this area. The qualitative work with adolescents tends to focus on adolescents’ experience of using SNS and perceptions of how their use of SNS influences their wellbeing (O’Reilly et al., 2018; Weinstein, 2018; Singleton, Abeles, & Smith, 2017), including adolescents with anxiety (Calancie et al., 2017) and depressive symptoms (Radovic et al., 2017). However, the focus of this review was to understand the direct impact of SNS use on adolescent wellbeing, focusing on quantifiable measures, therefore a review of quantitative research was more relevant in addressing this research question. Additionally, a review of quantitative research was more relevant in informing the development of the empirical study which used an experimental and quantitative design. It would be important for future reviews to further explore the underlying causes of the impact of SNS use on adolescent wellbeing including research that has used qualitative, quantitative, and mixed methods approaches.

**2.3.4 Exclusion criteria**

Studies that referred to SNS as an intervention delivery or SNS gaming were excluded, as were those that focused on general internet use, chat room use, private messaging only, video sharing platforms (e.g., YouTube) or online support forums, rather than specifically looking at SNS use. These other online platforms may share similar features to SNS; however, they were excluded based on the differences in function they perform for users (Wilson, Gosling, & Graham, 2012). Studies using “addictive use” of SNS as an independent variable were excluded, as the field of “SNS addiction” falls within the field of internet addiction (Young, 1999) and can be explained by different theories to that of general SNS use; this is beyond the scope of this review. Gray literature, commentary and editorial, conference proceedings, qualitative research, literature reviews and descriptive case studies were excluded, as were full-text inaccessible articles, due to time and cost constraints.

**2.3.5 Study selection**

The databases were searched for publications dated from January 2004 to January 2019. Search terms were performed on article titles and abstracts to maximise sensitivity, except within Web of Science where article title was used. An initial search was conducted in January 2018 with a revised search done in January 2019[[1]](#footnote-1). All articles were first screened by title and abstract by two reviewers independently (the first author and an independent trained researcher) using the pre-determined inclusion criteria. When screening articles, studies were also considered where the hypothesised relationship between SNS use and outcomes was not in the expected direction, for instance where the outcome variable may have been SNS use rather than wellbeing. Titles or abstracts without relevance to the review topic were discarded. If there was insufficient information to decide on the inclusion criteria, the full article was obtained and screened. All duplicates were removed and the remaining full text articles were reviewed by both reviewers independently for inclusion in the review. There was 100% agreement. In addition to database searches, relevant systematic reviews (Baker & Algorta, 2016; Best et al., 2014; Frost & Rickwood, 2017; Marino et al., 2018; McCrae et al., 2017) were checked and their included studies were screened for eligible articles. However, additional articles identified from these reviews did not meet inclusion criteria due to mean age, main outcome variable or focus on Facebook addiction, problematic use or general internet use.

**2.3.6 Data extraction**

Table 2.1 presents key data extracted from the included articles: (a) authors and date of publication (b) study design (c) country recruited in (d) recruitment (e) participant details (number/age) (f) location (g) SNS (h) wellbeing outcome. Data regarding study characteristics are presented in Table 2.2 including: (a) SNS variables; (b) SNS measure; (c) wellbeing outcome; (d) outcome measure; (e) summary of main findings; (f) moderators/mediators; (g) quality rating.

**2.3.7 Synthesis of results**

After qualitatively synthesising the data, common themes were identified to provide a collective interpretation and summary of the findings. The studies were grouped according to themes related to SNS use. Due to the nature of the research question and the heterogeneity across studies a narrative review approach was taken rather than conducting a statistical meta-analysis (Popay et al., 2006).

**2.3.8 Assessment of risk of bias in included studies**

Eligible articles were summarised and assessed for risk of bias using elements of the Quality assessment tool for observational, cohort and cross-sectional studies (NHLBI) that related to cross-sectional studies, as few appraisal tools are designed solely to appraise and report on the methodological quality of these. It was agreed prior to the quality assessment that all the identified studies would be retained regardless of the appraisal results. A summary of findings is provided in the results section.

**2.4 Results**

**2.4.1 Results of the literature search**

Figures 2.1 and 2.2 outline the search process completed in 2018 and updated in 2019

respectively. During the initial search in 2018, after duplicates were removed from the initial 159 records, 120 studies remained. These were screened by title/abstract leaving 24 studies potentially eligible for inclusion, of which 13 did not meet the inclusion criteria. Following a repeat search of the databases in January 2019 for the most recent relevant studies, a further 15 potentially eligible studies were identified of which 10 did not meet the inclusion criteria. In total, 16 studies were included in this systematic review.

**2.4.2 Participant characteristics**

Most studies reported the mean age of the participants. The mean of the reported mean ages for all studies combined was 15.44 years (range 10 to 26 years). Participants within the included studies were from several different countries, including China (2), Australia (2), Belgium (5), Malaysia (1), The Netherlands (1), Scotland (1), Israel (2), Spain (1), Taiwan (1), Austria (1), South Korea (1) and UK (1). This highlights the global nature of the research question. One study recruited participants from four different countries. Most studies recruited participants via convenience sampling, whilst two studies used stratified clustered sampling. There was a variety of ethnicities represented in the studies. Table 2.1 provides an overview of participant characteristics and study details of included studies.

Records identified through database searching

Web of Science = 57

Scopus = 55

Pubmed = 47

Total = 159

Records after duplicates removed

(n = 120)

Records screened by title/abstract

(n = 120)

Full-text articles assessed for eligibility

(n = 24)

Studies included in systematic review

(n = 11)

Records excluded based on title or abstract

(n = 96)

Full-text articles excluded

(n = 13)

Reasons for exclusions:

Poster abstract = 1

Conference paper = 1

Review paper = 1

Magazine article = 1

Irrelevant outcome variable (not related to wellbeing/psychological distress) = 2

Not specific to SNS = 4

Mean age >18 or mixed age sample without separate data for <18 = 2

Clinical population = 1

Duplicates removed

(n = 39)

*Figure 2.1.*PRISMA flowchart: original search in 2017/2018.

Records identified through database searching

Web of Science = 7

Scopus = 14

Pubmed = 24

Total = 45

Records after duplicates removed

(n = 38)

Records screened by title/abstract

(n = 32)

Full-text articles assessed for eligibility

(n = 15)

Studies included in systematic review

(n = 5)

Records excluded based on title or abstract

(n = 17)

Full-text articles excluded

(n = 10)

Reasons for exclusions:

Qualitative = 3

Irrelevant outcome variable (not related to wellbeing/psychological distress) = 1

Not specific to SNS = 3

Mean age not <18 = 3

Duplicates removed

(n = 7)

Total studies from both searches

(n = 16)

Included studies from 2017/2018 search

(n = 11)

*Figure 2.2.* PRISMA flowchart: follow-up search in 2019.

Table 2.1

*Participant characteristics and study details*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Authors (year) | Study Design | Country Recruited In | Recruitment | Participant details | Location | SNS | Wellbeing outcome |
| Apaolaza, He, & Hartmann (2014) | Cross-sectional | China | Convenience sample | N = 220, range = 14-19 years (mean = 16.71, SD = .931) | High school | Qzone | Positive mood |
| Blomfield Neira & Barber (2014) | Cross-sectional | Australia | Convenience sample | N = 1819, range = 13-17 years (mean = 14.6, SD = 1.05) | High school | General SNS | Social self-concept, self-esteem, depressed mood |
| Bourgeois, Bower, & Carroll (2014) | Cross-sectional | Australia | Convenience sample | N = 1,343, range = 11-18 years | High school | Facebook | Wellbeing |
| Frison & Eggermont (2015a) | Cross-sectional | Belgium | Convenience | N = 910, mean = 15.44 years, (SD=1.71) | High school | Facebook | Depressed mood |
| Frison & Eggermont (2016a) | Cross-sectional | Belgium | Convenience | N = 910, mean = 15.44 years (SD=1.71). | High school | Facebook | Depressed mood |
| Frison & Eggermont (2017) | Longitudinal | Belgium | Convenience sample | N = 440 at both time points (66% of total), range = 12-19 years, mean = 14.96 (SD=1.29), 39% boys. | High school | Instagram | Depressed mood |
| Naeemi & Tamam (2017) | Cross-sectional | Malaysia | Convenience sample | N = 401, range = 13-16, 52% boys | High school | Facebook | Psychological wellbeing |
| Valkenburg, Peter & Schouten (2006) | Cross-sectional | The Netherlands | Volunteer sample | N = 881, range = 10-19 years, 45% boys, mean = 14.8 (SD = 2.7) | Online survey | CU2 | Wellbeing and Social self-esteem |
| Wang et al. (2017) | Cross-sectional | China | Convenience sample | N = 365, range = 14-18, 48% male, mean = 15.96 (SD = 0.69) | High school | SNS | Depression |
| Woods & Scott (2016) | Cross-sectional | Scotland | Convenience sample | N = 467, range = 11-17 years. | High school | SNS | Sleep quality, anxiety and depression, self-esteem, |
| Ziv & Kiassi (2016) | Cross-sectional | Israel | Convenience sample | N = 200, 52.5% male, range = 13-26, mean = 17.27 (SD=2.42) | Community youth group leaders | Facebook | Psychological wellbeing |
| Ophir, Asterhan & Schwarz (2019) | Cross-sectional | Israel | Convenience sample | Study 1 - N = 86, range = 13-18 years. Study 2 - N = 162 | Informal education settings (local youth centres) | Facebook | Depression, Social Rejection, Victimisation of bullying |
| Frison et al. (2018) | Longitudinal | Belgium | Convenience sample | N = 1235 at both time points (67% of total), range = 12-19 years, mean = 14.76 (SD=1.41) | High school | Facebook | Depressive symptoms |
| De-Lenne et al. (2018) | Cross-sectional | Belgium, Austria, Spain, South Korea | Convenience sampling | N = 1983, 50.3% male, range = 12-19, mean = 14.41 (SD=1.08) | High school | Facebook | Poor mental wellbeing |
| Lai, Hsieh & Zhang (2018) | Cross-sectional | Taiwan | Stratified 2-stage cluster sampling (nationally representative sample) | N = 1211 students, 51.6% male, range = 12-17 years | High school | Facebook | Subjective wellbeing |
| Booker, Kelly & Sacker (2018) | Longitudinal | UK | Stratified clustered sampling (based on nationally representative sample) | N = 510 completed all 5 waves, range = 10-15 years, 51% males | Online survey | SNS | Wellbeing |

**2.4.3 Study characteristics**

There were 13 cross-sectional studies, and three longitudinal studies with timescales from six months to five years. All studies investigated the relationship between SNS use and wellbeing in adolescents, with 12 studies focusing on specific SNS: Facebook (9), Instagram (1), Qzone (1), and CU2 (a Dutch SNS), (1), and four studies focusing on SNS in general. SNS parameters varied with two studies measuring overall use, four studies measuring frequency of use, two measuring time spent on SNS, two studying emotional investment, two investigating perceived social support, and three studies focusing on type of use (active and passive). The following parameters appeared just once each: gratifications, emotional dependence on SNS, having an SNS profile, social support seeking, references to distress, frequency and tone of reactions, authentic self-presentation, overall use, night-time use, private Facebook interactions, social media interaction and online corumination. Ten wellbeing outcomes were measured altogether: eight studies included data on depressed mood, six on wellbeing, three on self-esteem, and one on each of the following outcomes: positive mood, social self-concept, sleep, anxiety, social rejection, and victimisation of bullying. All studies used self-report data, although one study also used content analysis of participants’ timelines as an additional method. All studies used quantitative data analysis. Table 2.2 provides details of the variables and measures used.

**2.4.4 SNS measures**

All studies used self-report measures of SNS use, with one study using an additional non-self-report measure, namely the analysis of three months of Facebook content. However, there was a large amount of heterogeneity in the measures used across these studies and in the aspects of SNS studied. Most studies developed their own measure of SNS use, with some reporting on reliability; two studies adapted validated scales.

*Frequency of use*

Of four studies investigating frequency of use, three focused on Facebook and one investigated SNS in general. Blomfield Neira and Barber (2014) adapted five items from Lenhart and Madden (2007) and added two items concerning changing a profile and communicating with friends met via the internet. They had participants respond using a 7-point Likert scale; good reliability was reported for this measure (α = .82). Bourgeois, Bower, and Carroll (2014) and Lai, Hsieh, and Zhang (2018) both developed their own measure of Facebook use per day, each had one item assessed on a 5-point Likert scale. Lai et al. (2018) combined their score of frequency of use, and a single item score of time spent, to form a “Facebook use” variable. Ziv and Kiassi (2016) used a newly-created 32-item Facebook use questionnaire, reduced from the 50-item Facebook use scale by Kim and Lee (2011) and by Ellison, Steinfield, and Lampe (2007). Seven items captured aspects of Facebook use and twenty-five items captured the importance of Facebook to the individual. Most items used a 5-point scale, but two items used the number of ticks from the possible answers. However, two further scores were calculated; one score captured frequency and duration of Facebook use (α= .83), and the other score captured depth of engagement.

*Time spent*

Two studies measured time spent on SNS. De Lenne, Vandenbosch, Eggermont, Karsay, and Trekels (2018) measured time spent (hours per day) on Facebook or Instagram with one item for each with a 7-point Likert scale. Lai et al. (2018) used a similar time per day question for Facebook use, but used a 5-point scale. They used factor analysis and combined the variables ‘frequency’ and ‘time spent’ to construct a ‘Facebook use’ variable.

*Overall use and Night-time use*

Woods and Scott (2016) measured ‘overall SNS use’ via six questions including an item on frequency of social media use on a 6-point scale and an item on duration of use on a 6-point scale. Reliability for this scale was questionable (α= .65) as reported by Field (2009). They also measured night time use through seven items, each using a 6-point scale, including frequency and duration questions. Reliability for this scale was considered acceptable (α= .78). Similarly, Valkenburg, Peter, and Schouten (2006) measured ‘Use of friend networking site’ with one question (number of days per week) to measure frequency of CU2 use, a ‘rate’ question (number of times per day) and an ‘intensity’ question measuring time spent, with a 7-point scale. The standardised items resulted in a low Cronbach’s alpha of .61.

*Depth of engagement*

Ziv and Kiassi (2016) looked at depth of engagement with Facebook, captured using selected items from their 32-item questionnaire such as “how often do you update your status or post content on Facebook?” Items were rated on a 5-point Likert scale, with different response options. Good internal consistency was reported for this measure (α= .88).

*Emotional investment and emotional dependence*

Three studies measured emotional investment or emotional dependence. Woods and Scott (2016) measured emotional investment using the Social Integration and Emotional Connection subscale taken from the Social Media Use Integration Scale (Jenkins-Guarnieri, Wright, & Johnson, 2013), but modified the scale to refer to Facebook. This 6-item scale used a 5-point Likert scale. It was considered a reliable measure in their sample (α= .78). Blomfield Neira and Barber (2014) used a 2-item measure selected from the 8-item Facebook Intensity Scale (Ellison et al., 2007), originally adapted from LaRose, Lai, Lange, Love, and Wu (2005). The two items were rated on a similar 5-point Likert scale. Naeemi and Tamam (2017) measured emotional dependence on Facebook using an adapted 6-item scale from Ross et al. (2009) and Steinfield, Ellison, and Lampe (2008), rated on a 5-point Likert scale (α= .87).

*Active and passive use*

Four studies investigated adolescent SNS type of use. Booker, Kelly, and Sacker (2018) measured social media interaction (active use) using two questions, one involving belonging to a SNS and the other relating to hours spent interacting on a normal school day, the latter question was responded to using a 5-point Likert scale. Responses were coded according to their response to the time spent item, or as not having a profile (score of 0). Frison, Bastin, Bjittebier, and Eggermont (2018) added two items to the 2-item subscale “active private Facebook use” from the Multidimensional Scale of Facebook Use (MSFU; Frison & Eggermont, 2015b), to measure private interactions (sending and receiving personal messages on Facebook). Responses were on a 7-point Likert scale. High internal consistency was reported (α= .94). Frison and Eggermont (2016a) measured active and passive Facebook use via mean scores on 7-point scales. Active public Facebook use was measured using three items and good reliability was reported (α= .84). Active private Facebook use was measured using two items relating to frequency of chatting and personal messaging. Passive use was measured with items relating to visiting a friend’s profile or a profile of someone not on their friends list. Reliability for both measures was considered sub-optimal (r = .66, p < .001; r = .52, p < .001, respectively). Frison and Eggermont (2017) conducted a study on Instagram use, measuring browsing (passive use), posting (active use), and liking (active use) behaviours; each was assessed with a single item and a 7-point Likert scale. Reliability was not reported.

*Frequency and tone of reactions*

One study, Valkenburg et al. (2006), looked at the frequency (α= .72) and tone of reactions (α= .87) on CU2, each was measured using two items and on a 5-point Likert scales. The frequency questions related to reactions from unknown persons and reactions from people only known through the internet. The questions on tone referred to reactions to their profile and reactions from friends to their posts.

*Self-presentation*

Wang et al. (2017) used the Chinese version (Niu, Bao, Zhou, Kong, & Sun, 2015) of the four item Honest Self-presentation Scale (Kim & Lee, 2011) which assessed the extent to which SNS users authentically share information about themselves online. Each item was rated on a 7-point scale (α = .72).

*Gratifications of SNS use*

Apaolaza et al. (2014) measured three gratifications of Qzone use (information-seeking, socialising, and entertainment), using measures previously developed by Ku, Chu, and Tseng (2013), Lee and Ma (2012), Lee, Goh, Chua, and Ang (2010) and Park, Kee, and Valenzuela (2009). These were multiple item measures scored on a 4-point Likert scale. These scales were reported as having good content validity and good reliability (Cronbach’s alpha ranged from .82 to .85).

*Social support seeking and perceived social support*

Four studies explored social support on SNS. Frison and Eggermont (2015a) measured social support seeking on Facebook using a 2-item measure constructed by the authors, with responses rated on a 5-point scale. Reliability was considered good (r = .90, p < .001). Perceived social support through Facebook was assessed using a 4-item adapted version of the family subscale of the multidimensional scale of perceived social support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). This scale included four statements, scored on a 5-point Likert scale. This same scale was used by Frison and Eggermont (2016a) and by Frison, Bastin, Bjittebier, and Eggermont, (2018). Wang et al. (2017) measured perceived social support on general SNS, but used all twelve items of the MSPSS, which cover perceived social support from three sources; family, friends, and significant others, rated on a 7-point scale. High internal consistency was reported across all studies using this measure (Cronbach’s alpha ranged from .91 to .96).

*Online corumination*

Frison et al. (2018) used a shortened version (Hankin, Stone, & Wright, 2010) of the corumination questionnaire (CRQ; Rose, 2002) in their longitudinal study to assess the extent of adolescents’ corumination with their closest friend on Facebook. This scale covered nine aspects of coruminative behaviour, each rated on a 5-point Likert scale with a mean score calculated. Internal consistency was high (α= .96).

*References to distress*

Ophir et al. (2019) used two trained raters to analyse three months of Facebook content for explicit references to distress, which were classified into depressive, psychosocial or undefined distress. Any discrepancies were re-evaluated to reach agreement. Inter-rater reliability was reported to be satisfactory (κ= .73).

**2.4.5 Outcome measures of wellbeing**

*Depressed mood*

Half of the studies measured depressed mood and of these, five used the standardised Centre for Epidemiological Studies Depression Scale for Children (CES-DC; Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986), but with some differences. The CES-DC is a 20-item measure with a 4-point Likert scale. However, Frison and Eggermont (2015a; 2016a; 2017) selected five items from this scale to operationalise depressed mood, their sole outcome measure, based on a study by Olsson and von Knorring (1997); depressed mood was calculated as a mean score. In comparison, Frison et al. (2018) used the shorter 10-item version of the CES-DC, removing three items to give a mean score of the seven remaining items. Lastly, Wang et al. (2017) used the 20-item adult version of the CES-D scale (Radloff, 1977) as the only outcome measure, covering six areas of content. All five studies reported high internal consistency for this standardised scale (Cronbach’s alpha ranged from .83 to .91).

Alternative depression scales were used by three studies. Woods and Scott (2016) used the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) to measure depression and reported good reliability (α= .72). This standardised HADS consists of seven items across two subscales, one for anxiety and one for depression. Ophir et al. (2019) used the 21-item Beck Depression Inventory-II (BDI-II; Beck, Steer, Ball, & Ranieri, 1996) as one of three self-report measures of distress (alongside social rejection and victimisation of bullying). They reported good internal consistency with this scale (α= .90). Blomfield Neira and Barber (2014) used a 4-item measure of depression taken from previous research by Barber (2006), Barber, Eccles, and Stone (2001)and Modecki, Barber, and Vernon (2013). They also measured social self-concept and self-esteem as other indicators of adjustment. Similar good internal consistency was reported for this scale (α= .76).

*Wellbeing*

Seven studies identified wellbeing as their main outcome but each used a different measure. Naeemi and Tamam (2017) used the 42-item Ryff Psychological Wellbeing scale (Ryff, 1989) comprising seven items for each of six components, such as autonomy and self-acceptance. The study reported good reliability across the dimensions (Cronbach’s alpha ranged from .69 to .85). De Lenne et al. (2018) used the 5-item Mental Health Inventory (MHI-5; Rumpf, Meyer, Hapke, & John, 2001) to measure poor mental wellbeing over the previous two weeks, and reported good internal consistency (α= .76). Ziv and Kiassi (2016) used the 22-item General Wellbeing Index developed by Hunt and McKenna (1992) that reflects general mood, vitality and physical health. This scale demonstrated high internal consistency (α= .96). Lai et al. (2018) measured subjective wellbeing using three items adapted from Cohen and Wills (1985) and Heatherton and Polivy (1991): social support, life satisfaction and social satisfaction. However, reliability was not reported. In their longitudinal study, Booker et al. (2018) created their own positive marker (happiness) and used a validated instrument, the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), as a negative marker (socio-emotional difficulties) to assess wellbeing. They reported a Cronbach alpha of .77 for their happiness scale, and .67 for the SDQ. Bourgeois et al. (2014) only used the 5-item Emotional Symptoms subscale of the SDQ as their wellbeing measure and reported a similar reliability (α= .65). Lastly, a study by Valkenburg et al. (2006) measured wellbeing through the 5-item Satisfaction with Life scale developed by Diener, Emmons, Larsen, & Griffin (1985), with high internal consistency (α= .89), as well as measuring social self-esteem.

*Self-esteem*

Three studies measured self-esteem as an outcome variable. Valkenburg et al. (2006) looked at social self-esteem and used three subscales (physical appearance, close friendship, and romantic appeal) of Harters’ self-perception profile for adolescents (Harter, 1988). Internal consistency was considered high across all subscales. Woods and Scott (2016) used the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) to measure trait self-esteem and reported high internal consistency (α= .86). Blomfield Neira and Barber (2014) used a 3-item self-esteem scale from previous research (Barber, 2006; Barber et al., 2001; Modecki et al., 2013). It followed a similar format to their depression scale, also taken from previous authors, and showed high internal consistency (α= .87).

*Positive mood*

Apaolaza et al. (2014) measured positive mood using the seven items of the positive affect (PA) component of the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) and reported high internal consistency (α= .92).

*Social self-concept*

Blomfield Neira and Barber (2014) measured social self-concept using a scale adapted from existing measures (Marsh, 1992a, 1992b, 1992c) as used in previous research by Blomfield Neira and Barber (2011). Acceptable reliability was reported (α= 0.75).

*Anxiety*

Woods and Scott (2016) used the anxiety items from the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) to measure anxiety as a wellbeing outcome and reported high internal consistency (α= .80).

*Sleep*

Woods and Scott (2016), assessed sleep quality using the 19-item Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Higher scores indicated poorer sleep quality. They reported acceptable reliability for this scale (α= .76).

*Social rejection and victimisation of bullying*

Ophir et al. (2019) used three measures of distress; depression, social rejection and victimisation of bullying. The authors assessed social rejection using four items from the social problems subscale of the widely used Youth Self Report Protocol (YSR; Achenback, 1991). To assess victimisation of bullying, the authors used six items selected from the well-validated 33-item Peer Relations Questionnaire (PRQ; Rigby, 1998). All scales demonstrated good internal consistency.

Table 2.2

*Study characteristics and main findings*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Authors (year) | SNS | SNS variables | SNS measure | Wellbeing outcome | Outcome measure | Summary of main findings | Mediators / Moderators |
| Apaolaza, He, & Hartmann (2014) | Qzone | Gratifications (socialising, information seeking, entertainment) | Adapted scales | Positive mood | PANAS (PA component) | All gratifications significantly linked to positive mood. |  |
| Blomfield Neira & Barber (2014) | General SNS | SNS profile, SNS frequency, SNS investment | SNS profile: own measure, Frequency: adapted scale, Investment: adapted FIS, | Social self-concept, self-esteem, depressed mood | Social self-concept (3 items), self-esteem (3 items), depressed mood (4 items) | All SNS variables positively correlated with social self-concept. SNS investment negatively associated with self-esteem, but SNS investment and SNS profile positively associated with depressed mood. Having an SNS profile linked to more negative indicators in females compared to males. |  |
| Bourgeois, Bower, & Carroll (2014) | Facebook | Frequency of checking Facebook | Own measure | Wellbeing | Emotional symptoms subscale from SDQ | Frequency of checking Facebook is linked to increase in reported emotional symptoms. Girls who use Facebook more often have higher levels of emotional symptoms. |  |
| Frison & Eggermont (2015a) | Facebook | Social support seeking through Facebook | Social support seeking: own measure, Perceived social support: adapted MSPSS | Depressed mood | CES-DC | Positive relationship between daily stress and support seeking through Facebook. Perceived social support on Facebook mediated the relationship between social support seeking on Facebook and adolescents' depressed mood. | Perceived social support |
| Frison & Eggermont (2016a) | Facebook | Facebook use (Active private, active public, passive), Perceived social support | Facebook use: own measure, Perceived social support: adapted MSPSS | Depressed mood | CES-DC | Passive FB use positively predicts adolescents' depressed mood. Active public FB use positively predicted depressed mood whereas active private use did not predict depressed mood. Passive use positively predicted girls depressed mood but not boys. Active public use positively predicted boys depressed mood, but not girls. Girls who actively use Facebook and perceived social support benefit as perceived social support negatively predicted girls' depressed mood. |  |
| Frison & Eggermont (2017) | Instagram | Types of Instagram Use (Browsing, Posting, Liking). | Own measures | Depressed mood | CES-DC | Instagram browsing at T1 positively predicted adolescents' depressed mood at T2. Instagram posting and liking at T1 were not related to depressed mood at T2. |  |
| Naeemi & Tamam (2017) | Facebook | Emotional dependence on Facebook | Adapted scale | Psychological wellbeing | Ryff psychological well-being scale | A negative association between emotional dependence on Facebook and overall psychological well-being. Self-efficacy did not moderate this relationship. | Self-efficacy |
| Valkenburg, Peter & Schouten (2006) | CU2 | Use of friend networking site (frequency, rate and intensity of use), frequency of reactions to profiles, tone of reactions to profiles) | All own measures | Wellbeing and Social self-esteem | Wellbeing measured using 5-item Satisfaction with life scale (Diener et al., 1985). Social self-esteem measured using 3 subscales of Harters' (1999) self-perception profile for adolescents | Positive feedback enhanced self-esteem whereas negative feedback decreased self-esteem. No relationship between the frequency of reactions to the profile and self-esteem. |  |
| Wang et al. (2017) | SNS | Authentic online self-presentation, perceived social support, rumination | Self-presentation: adapted HSS, Perceived social support: MSPSS | Depression | CES-DC | Authentic online self-presentation was negatively associated with depression, perceived social support was negatively associated with depression and rumination was positively associated with depression. Perceived social support and rumination mediated the association between authentic self-presentation and depression in an unparallel and sequential fashion. | Perceived social support and rumination |
| Woods & Scott (2016) | SNS | Emotional investment, overall and night-time specific use | Emotional investment: modified SIEC subscale from SMUIS, Overall use: own measure, Night-time use: own measure, | Sleep quality, anxiety and depression, self-esteem, | Sleep (PSQI), Anxiety and Depression (HADS), Self-esteem (RSES) | Increased overall use, night-time use and emotional investment were significantly correlated with poor sleep quality, anxiety and depression, and lower self-esteem. Effect sizes were higher for poor sleep quality and night-time specific use, and anxiety , depression and self-esteem with emotional investment. Night-time-specific social media use and emotional investment in social media significantly predicted poorer sleep quality. |  |
| Ziv & Kiassi (2016) | Facebook | Facebook use (frequency and duration, depth of engagement in Facebook) | Frequency and duration: adapted scale, Depth of engagement: adapted scale | Psychological wellbeing | General Well-being index (Hunt & McKenna, 1992) | Positive relationship between Facebook use and wellbeing, and this was particularly strong for participants with low mental resilience. Depth of engagement was the only significant predictor of wellbeing. Positive relationship between Facebook use and resilience but depth of engagement was the only significant predictor of resilience. | Mental resilience |
| Ophir, Asterhan & Schwarz (2019) | Facebook | Study 1 - Explicit references to distress. Study 2 - 'About' section and 'timeline activity' data, non-explicit references to distress | Own content analysis of Facebook pages and non-explicit references to distress coded by 6 concrete categories | Depression, Social Rejection, Victimisation of bullying | BDI-II, 4 items from the social problems sub-scale of the Youth Self Report protocol (YSR), 6 items from the Peer Relations Questionnaire (PRQ) | Study 1. Explicit references to distress in Facebook postings predict depression among adolescents. Study 2. Less explicit features of behaviour on Facebook profile can predict social rejection and victimisation of bullying. |  |
| Frison et al. (2018) | Facebook | Private FB interactions, online corumination, perceived online support | Private Facebook interactions: adapted own scale (MSFU), Corumination: adapted CRQ, Perceived social support: MSPSS, | Depressive symptoms | CES-DC | Private FB interactions were related to adolescents' perceptions of online social support but also predictive of this over time. Perceptions of online social support were only predictive of decreases in depressive symptoms over time in girls. The indirect relationship between private FB interactions, perceived online support and adolescents’ depressive symptoms is stronger in girls. |  |
| De-Lenne et al. (2018) | Facebook | Time spent on Facebook and Instagram | Time spent: Own measure | Poor mental wellbeing | MHI-5 | Positive relationship between Facebook use and poor mental well-being. Only an indirect positive relationship between Instagram use, the internalisation of sexual ideals and poor mental well-being. | Internalisation of professional, social, sexual and romantic ideals. |
| Lai, Hsieh & Zhang (2018) | Facebook | Facebook use (frequency = days/week, time spent = hours/day) | Facebook use = own measure | Subjective wellbeing | 3 item questionnaire (social support, life satisfaction and social satisfaction) | Positive relationship between Facebook use and wellbeing in males and females, but stronger for males. |  |
| Booker, Kelly & Sacker (2018) | SNS | Social media interaction (2 items) - SNS profile and hours/day chatting. | Own measure | Wellbeing | Happiness and socio-emotional difficulties (positive and negative markers of well-being). 6 questions covered domains of life e.g. friends, family, appearance, school, school work and life and SDQ measured negative aspects of wellbeing. | Significant correlations between interacting on social media and reduced wellbeing. Higher social media interaction at age 10 was associated with declines in socio-emotional difficulties thereafter in females but not males. |  |

**2.4.6 Quality assessment**

The methodological quality is recorded in Table 2.3. This was done following the data extraction stage to prevent bias in extracting data and all studies merited inclusion in the review. Each of the studies clearly stated a research question and defined their study population. Most studies recruited through convenience sampling increasing the risk of selection bias. Only three studies reported an eligibility rate of over 50%. Two longitudinal studies (Frison & Eggermont, 2017; Frison et al., 2018) reported on power and effect sizes, whereas all other studies did not report this. However, sample sizes were relatively large. Generally, studies employed a cross-sectional design (n = 13) therefore these were susceptible to selection, information and confounding bias (Yu & Tse, 2012), and evidence for causal relationships was weak. All longitudinal studies allowed an appropriate time period in between measurements (minimum six months), and reported follow up rates, yet these fell short of the acceptable follow up rate of 80% or more which raises potential for attrition bias in these studies and limits generalisability. Most studies defined measures in detail, reporting a Cronbach’s alpha. However, five studies did not report on reliability or validity for SNS measures, and one study did not report on these for outcome measures. Some measurement bias may exist if reliable and valid measures are not used, which raises the question of the validity of the reported findings of these studies. The studies’ reliance on mainly self-report data increases the risk of response bias, such as social desirability bias and recall bias. Overall, methodological quality was considered poor to good, with 56% of studies (n = 9) rated good, 38% fair (n = 6) and one study rated poor due to not reporting validation of both SNS measures and outcome measures.

Table 2.3

*Quality assessment tool (NHLBI)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Research question clearly stated | Population defined | Participation rate | Selection | Sample size / power | Exposure prior to outcome | Sufficient timeframe | Levels of exposure | Validity of SNS variables | Exposure assessed over time | Validity of outcome measures | Loss to follow-up (<20%) | Confounding variables | Quality rating |
| Apaolaza, He, & Hartmann (2014) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | N | Fair |
| Blomfield Neira & Barber (2014) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | Y | Good |
| Bourgeois et al. (2014) | Y | Y | NR | Y | N | N | N | Y | NR | NA | Y | NA | Y | Fair |
| Frison & Eggermont (2015a) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | Y | Good |
| Frison & Eggermont (2016a) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | Y | Good |
| Frison & Eggermont (2017) | Y | Y | NR | Y | Y | Y | Y | NA | NR | Y | Y | N | Y | Good |
| Naeemi & Tamam, (2017) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | N | Fair |
| Valkenburg, Peter & Schouten (2006) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | Y | Good |
| Wang, Wang & Zhao (2017) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | N | Good |
| Woods & Scott (2016) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | Y | Good |
| Ziv & Kiasi (2016) | Y | Y | NR | Y | N | N | N | Y | Y | NA | Y | NA | N | Fair |
| Ophir, Asterhan & Schwarz (2019) | Y | Y | Y | Y | N | N | N | NA | Y | NA | Y | NA | N | Good |
| Frison et al. (2018) | Y | Y | NR | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | Good |
| De-Lenne et al. (2018) | Y | Y | NR | Y | N | N | N | Y | NR | NA | Y | NA | Y | Fair |
| Lai, Hsieh & Zhang (2018) | Y | Y | Y | Y | N | N | N | Y | NR | NA | NR | NA | Y | Poor |
| Booker, Kelly & Sacker (2018) | Y | Y | Y | Y | N | Y | Y | Y | NR | Y | Y | N | Y | Fair |

**2.4.7 Main findings**

This review aimed to investigate the impact of SNS use on wellbeing in adolescents. Table 1.2 summarises the main findings of each study and the results are outlined below under themes relating to types of SNS use. As some studies were relevant to multiple themes, these studies appear in multiple sections.

*Temporal aspects of SNS use*

There were mixed findings across the different SNS platforms on the impact of time related aspects of SNS use on wellbeing. Of the seven studies examining time spent on SNS on wellbeing, two studies found a significant positive impact, three studies found a significant negative impact, whilst two studies found no significant association. Lai et al. (2018) explored the use of Facebook, measured by frequency and time spent, with subjective wellbeing in 1211 adolescents, aged 12-17 years. The results showed a positive relationship between Facebook use and wellbeing in both males and females, yet this relationship was stronger in males. Similarly, Blomfield Neira and Barber (2014) found a positive association between SNS frequency and social self-concept in Australian adolescents, aged 13 to 17 years. In relation to depression, there appeared to be an inconsistency in the reporting of this study. Interestingly, as reported in their Table 2, there was a significant negative correlation between SNS frequency and depressed mood, however the authors report that “SNS profile and SNS frequency were also significantly positively correlated with depressed mood”. The hierarchical regression did not reveal a significant link between SNS frequency and depressed mood. A correlation coefficient of -0.09 is reported in their Table 2 which may have reached statistical significance due to the size of the sample (1819) rather than the strength of the association. It is therefore safest to conclude that data from this study do not reveal any systematic association between SNS frequency alone, and depressed mood.

Regarding negative outcomes, Bourgeois et al. (2014) found that those who checked Facebook more frequently experienced a higher incidence of emotional symptoms, with girls having higher levels of emotional symptoms compared to boys. Similarly, De Lenne et al. (2018) found Facebook use, but not Instagram use (time spent per day), to be directly associated with poor mental wellbeing. The internalisation of sexual ideals was found to be a mediator in the indirect relationship between Instagram use and poor mental wellbeing. A study by Woods and Scott (2016) revealed that adolescents who used social media more (both overall and at night) experienced poorer sleep quality, lower self-esteem and higher levels of anxiety and depression.

Two studies found no significant associations between time related aspects of SNS use and wellbeing. Ziv and Kiassi (2016) found no association between frequency and duration of Facebook use and wellbeing. Similarly, Valkenburg et al. (2006) found no significant association between CU2 use (including frequency and rate) on wellbeing.

*Types of SNS use*

Of the four studies examining different types of SNS use on wellbeing, one study found both significant positive and negative associations, one study found a negative impact and a non-significant association over time, and two studies found significant positive impact of SNS use on wellbeing over time. One study investigated both active and passive Facebook use, and one study looked at active and passive Instagram use. Two studies investigated just active use, one using Facebook and one using general SNS use. Frison and Eggermont (2016a) found that active and passive Facebook use were differentially related to depressed mood, with gender-specific differences in the effects. The study found the harmful impact of Facebook use exclusively occurs among girls who passively use Facebook and among boys who actively use public Facebook features. Girls who actively use Facebook, either publicly or privately, and who perceive online social support benefit from active Facebook use. However active private use was not a significant predictor of depressed mood, if social support was not perceived. Passively using Facebook had negative outcomes among girls, whereas actively using Facebook had positive outcomes among girls, with the effect of active public use mediated by perceived social support. Boys, however, experienced direct negative outcomes from active public Facebook use. Similarly, a longitudinal study by Frison and Eggermont (2017) found Instagram browsing (passive use) to predict increased depression six months later; this was not found with Instagram liking or posting (active use). Frison et al. (2018) looked at private Facebook interactions in a longitudinal study over six months, and found an indirect relationship between private Facebook interactions, perceived online support and reduced depressive symptoms, and the effects lasted longer in girls. Lastly, another longitudinal study (Booker et al. 2018) revealed that increased social media interaction (number of hours chatting on SNS per day) at age 10 years was associated with decreased happiness, and increased socio-emotional difficulties at that time, but was associated with decreased socio-emotional difficulties over time (yearly for five years) in females.

*Emotional aspects of SNS use*

Of the nine studies examining these variables, two studies found a significant positive impact, four studies found a significant negative impact, one study found both significant positive and negative associations, two studies found a significant positive impact as well as a non-significant association across gender, and over time. Apaolaza et al. (2014) found that gratifications of Qzone use (socialising, entertainment and information-seeking) were all positively associated with positive mood. Ziv and Kiassi (2016) found a positive effect of depth of engagement on Facebook on wellbeing, particularly in adolescents with low mental resilience. Similarly, two studies looked at emotional investment on SNS. One study found an increase in social self-concept, but a decrease in self-esteem, and increase in depressed mood (Blomfield Neira & Barber, 2014). Similarly, Woods and Scott (2016) found emotional investment to decrease self-esteem and increase anxiety and depression. Emotional dependence was also linked to a negative impact on wellbeing (Naeemi and Tamam, 2017), a relationship not mediated by self-efficacy.

Three studies looked at perceived social support seeking in relation to Facebook, and as a mediator variable for the impact on depressed mood, with one study by Frison and Eggermont (2015a) finding that daily stress resulted in social support seeking and if support was perceived, this reduced depressed mood but if support was not perceived, it increased depressed mood. Frison and Eggermont (2016a), using the same sample and data set, explored the relationship between different types of Facebook use, perceived online social support, and adolescents’ depressed mood. They found that perceived online social support negatively predicted depressed mood in girls, but not boys. Similarly, another study by Frison et al. (2018) found an association between perceived social support and decreased depressed mood in girls and boys, but this was only predictive of girls’ decreased depressed mood over time (six months). Perceived social support was found to be a mediator in all three studies. Frison and Eggermont (2015a) found that when social support was sought and also perceived, it decreased depressed mood, whereas if support was sought but not perceived, depressed mood increased. In Frison and Eggermont’s (2016a) later study, the relationship between girls active Facebook use was significantly mediated by perceived social support as this negatively predicted girls’ depressed mood whereas a direct relationship existed between active public Facebook use (in girls and boys) and depressed mood. In Frison et al. (2018) study, private Facebook interactions only lead to decreases in depressed mood indirectly through perceived social support. Frison et al. (2018) also looked at the mediating role of online corumination and found that if private interactions involved corumination, this was associated with greater depressive symptoms. Direct relationships between private Facebook interactions and depressed mood were otherwise not significant.

Lastly, a recent study by Ophir et al. (2019) with 86 adolescents found that adolescents who posted explicit references to distress on Facebook experienced a greater number of depressive symptoms. However, these postings were found to be rare. Further, explicit references to distress did not predict either social rejection or victimisation of bullying.

*Communication aspects of SNS use*

Two studies investigated aspects of online communication. Of these two studies, one study found both significant positive and negative associations, whilst the other study found a significant positive impact. Valkenburg et al. (2006) found a direct relationship between negatively toned feedback on CU2 and low self-esteem, and a direct positive relationship between positive tone of feedback and social self-esteem. A study by Wang et al. (2017) found that authentic self-presentation on SNS was associated with reduced depression. Additionally, rumination and perceived social support individually, as well as sequentially, mediated this association: adolescents who present themselves authentically on SNS could perceive sufficient social support, which in turn reduces their tendency to ruminate and is linked to a reduction in depression.

*Profile features of SNS*

Two studies measured profile features of SNS and their impact on wellbeing with both positive and negative associations reported. Blomfield Neira and Barber (2014) found that males with a SNS profile reported significantly higher social self-concept compared to males without, whereas this was not found in females. In females, those who had a SNS profile had significantly lower self-esteem and higher depressive symptoms than females without. Ophir et al. (2019), in the second part of their study, suggested that several features of Facebook can indicate the existence of social rejection and victimisation of bullying. The number of check-ins, and number of people in pictures posted by themselves, were negatively associated with rejection and depression. Social rejection and victimisation of bullying were both negatively associated with having pictures of others on their timeline, and social rejection was positively correlated with displaying positive attitudes towards others. Posts by others, check-ins, gothic and dark content, other people in pictures and positive attitudes towards others were identified as less explicit features of Facebook that could predict social rejection and victimisation of bullying.

*Summary of main findings*

In summary, of the eight studies that looked at SNS use on depressed mood, four studies found a significant positive impact, whereas six studies found a significant negative impact. Of the seven studies that looked at SNS use on wellbeing, three studies reported significant negative effects, two studies reported significant positive effects, with one also reporting no association, and one study found both significant positive and negative effects as well as no significant association. There were four studies that explored SNS use on other indicators of wellbeing. Of these, two studies reported significant negative effects of SNS use, whereas one study reported significant positive effects of SNS use, and one study reported both significant positive and negative effects as well as no association.

Overall across all indices of SNS use and outcome variables, seven studies reported a significant positive impact, 11 studies reported a significant negative impact, and three studies reported both positive and negative impact and no significant associations. For each of the themes identified, studies were checked to see if the study quality affected the findings; this was not the case.

The quality appraisal rating was mixed across studies with most studies rating fair or good. No patterns of quality appraisal bias were identified to impact on the significance of effects found in the studies, in that high quality studies did not produce statistically significant findings whilst low quality studies did not produce non-statistically significant findings. Further, the quality of the studies did not appear to have impact on the direction of the relationship between SNS use and wellbeing measures. Specifically, of the six studies that were rated as fair on the quality appraisal tool, three of these reported significant positive findings, three reported significant negative findings, and one study found no significant association. Of the nine studies that were rated as good, nine of these reported significant positive effects across different variables, nine found significant negative effects and five studies reported no significant associations. These findings indicate that both the fair and good quality studies have mixed findings. In fact, the quality of the studies does not seem to affect the conclusions drawn, but the heterogeneity of measures used, and the different aspects of SNS use measured, do.

**2.5 Discussion**

Studies on social media use, although rapidly expanding, are considered a new area of research given that SNS’ popularity has grown since 2004 and given the growing role of social media in the lives of contemporary adolescents. For this reason, there are many studies investigating the impact of social media on users’ wellbeing. However, there are fewer studies investigating the impact on adolescents’ wellbeing. Therefore, this review aims to consider the impact of SNS use on adolescent wellbeing.

Overall, across the 16 studies included in this review, there were mixed findings on the impact of SNS use on adolescent wellbeing. However, there was a high degree of heterogeneity in terms of the parameters of SNS use, the indicators of wellbeing and the measures utilised. Some studies focused on a single SNS, whereas others included multiple platforms. This heterogeneity impacted on the ability to make direct comparisons between the studies. Therefore, the evidence for positive and negative impact on wellbeing has been discussed under themes relating to SNS use that emerged from the main findings, taking into consideration the similarities and differences between studies, and the strength of the evidence.

**2.5.1 Temporal aspects of SNS use**

The review yielded mixed results on the impact of time-related measures of SNS use such as frequency, rate, time spent, and overall use, on adolescent wellbeing. Although there were mixed findings, there were also two smaller studies that reported no significant effect. The positive impact from SNS and Facebook use was found on measures of self-concept and subjective wellbeing, whereas the negative impact was on measures of wellbeing, emotional symptoms, sleep, anxiety, depressed mood, and self-esteem. Sample sizes were all considered large and appropriate for the study design, ranging from 467 to 1983 participants. Not all studies used validated SNS use measures, which increased the risk of measurement bias, but this was similar for studies showing both types of impact. Similarly, all outcome measures were validated apart from one study (Lai et al., 2018). In this review, there were more negative than positive outcomes associated with higher SNS usage, which is consistent with previous research findings on self-esteem (Vogel, Rose, Roberts, & Eckles, 2014), depression (Farahani et al., 2011) and wellbeing (Kross et al., 2013).

The impact of SNS on wellbeing may be explained by three different theories. Negative relationships may be explained through the theory of social comparison (Festinger, 1954) that suggests that people make upward comparisons with the positive self-presentations of others. Chou and Edge (2012) supported this theory as they found that undergraduates who spent more time on Facebook reported upward social comparison, whilst Zuo (2014) found that high levels of social comparison on Facebook predicted poor mental health in undergraduates. Additionally, the displacement hypothesis proposes that time spent on one activity, such as on SNS, reduces time spent on another meaningful activity, such as social interaction (Lee, 2009), which may result in reduced quality of offline relationships (Kraut et al., 1988) and negatively impact wellbeing. Alternatively, positive relationships may be explained through the augmentation hypothesis (Walther, 1996), which argues that communicating online increases the quality of existing real-life relationships, thus enhancing wellbeing.

Although there was heterogeneity across these measures it was noted that all studies looked at a similar time scale (time per day), showing consistency in this respect. However, time-related measures do not provide information about how the SNS were used, which may contribute to the different outcomes. Future research should focus on how people engage with SNS to aid the understanding of mechanisms underlying the associations with wellbeing.

**2.5.2 Types of SNS use**

Several studies considered active and passive SNS use in relation to wellbeing and some common findings emerged for each type, although gender differences were reported. Passive use, both on Facebook (Frison & Eggermont, 2016a) and Instagram (Frison & Eggermont, 2017) was associated with negative impacts on wellbeing which is consistent with past research on Facebook (Burke et al., 2010; Krasnova et al., 2013) and Instagram (Brown & Tiggeman, 2013). Gender differences revealed the harmful impact of passive Facebook use only in girls (Frison & Eggermont, 2016a). Upward social comparison may explain this negative effect of passive use to some extent, especially in girls who may be more vulnerable than boys given their higher self-presentation concerns (McAndrew & Jeong, 2012), and higher tendency for comparison (Haferkamp & Kramer, 2011). Both studies on passive use measured depressed mood via the same validated outcome measure, adding weight to the outcome findings, but both used their own scales comprising only one or two items to measure passive use, which limits the reliability of this association. The study on passive Instagram use was longitudinal, suggesting a causal relationship in this case.

Active SNS use also had mixed effects on wellbeing, and outcomes varied between the genders. Females benefited from active Facebook use, whether using the public or private features, but only if they perceived social support, whereas boys experienced direct negative effects of active public Facebook use (Frison and Eggermont, 2016a). In two longitudinal studies, Frison et al. (2018) confirmed a role of perceived social support in reducing depressive symptoms, with longer-lasting effects in girls, and Booker et al. (2018) noted that active use at age 10, while associated with poorer wellbeing then, was associated with improved wellbeing in girls five years later. Previous studies have suggested a positive impact of active Facebook use (Burke et al., 2010; Deters & Mehl, 2013), so the negative impact of boys’ active public use needs to be better understood. Frison and Eggermont (2016a) reason in their paper that the frequency and tone of online reactions may be significant factors in this, with lower frequency or negative tone leading to reduced wellbeing; this is consistent with the findings by Valkenburg et al. (2006). Active public use often involves interactions with close friends and therefore a possible explanation for the positive impact of active public use in girls may be the increased perceptions of social support from active use. This is consistent with the direct or main-effects hypothesis (Cohen & Wills, 1985) which supports that high social support enhances wellbeing. A factor possibly involved in gender response differences, cited by Frison and Eggermont (2016a), is the difference in adolescent girls’ and boys’ social skills. Girls have more prosocial skills offline than boys (Pecjak, Valencic, Kalin, & Peklaj, 2009), and therefore may develop more meaningful relationships online, which is linked to the ‘rich get richer’ model (Kraut et al., 2002). This model states that those with strong social skills and networks gain more from online communication through furthering these skills, which then maintains their relationships. Further, the ‘poor get richer’ model, which is supported by the social compensation hypothesis (McKenna & Bargh, 2000), would suggest that the internet is more beneficial for socially anxious and socially isolated individuals (Szwedo, Mikami, & Allen, 2012); it is an alternative explanation for the positive impact of active use for this group of users.

The studies on active SNS use looked at both Facebook and general SNS. Two studies in this review were longitudinal and are thus more robust than cross-sectional studies in inferring causality. These longitudinal studies highlighted that active use of SNS could be beneficial over time, in girls, whereas passive use could increase depression over time (Frison & Eggermont, 2017). All studies used valid outcome measures which adds strength to their findings, and both Frison and Eggermont (2016a) and Frison et al. (2018) used a reliable measure for Facebook use. Booker et al. (2018) measured “chatting via social media” with one question. Future studies should include longitudinal studies, using reliable and validated measures for active and passive use, to clarify the causality and gender differences in outcomes on wellbeing.

**2.5.3 Emotional aspects of SNS use**

In addition to understanding the links with active and passive SNS use, it is important to understand the impact of SNS use on wellbeing when measures were based on attitudes and behaviours towards SNS use. Where underlying motives were more positive, the association tended to be beneficial, such as in the studies on gratifications of use (Apaolaza et al., 2014), depth of engagement (Ziv & Kiassi, 2016), social support-seeking (Frison & Eggermont, 2015a) and perceived social support (Frison & Eggermont, 2016a; Frison et al., 2018). On the other hand, measures related to more negative attitudes and behaviours such as emotional dependence (Naeemi & Tamam, 2017), emotional investment (Woods & Scott (2016), corumination (Frison et al., 2018) and explicit mentions of distress (Ophir et al., 2019) revealed harmful associations. The ‘rich get richer’ (Kraut et al., 2002) may explain this pattern, in that those with strong social skills and networks gain from maintaining and enhancing relationships online. An alternative explanation is the ‘poor get poorer’ model (Armstrong, Phillips, & Saling, 2000) where those with fewer social skills or higher social anxiety may use SNS to avoid real-life problems and experience reduced wellbeing. On the other hand, the social compensation model proposes that those with difficulties communicating offline, may feel more comfortable communicating online (Weidman et al., 2012) and may have increased depth of engagement, so they benefit from support from a wider audience compensating for their limited support networks offline. However, Blomfield Neira and Barber’s (2014) investment measure led to different findings for different wellbeing measures; it was positively linked to social self-concept, as could be explained by the ‘rich get richer’ model, but also positively associated with depressed mood and negatively associated with self-esteem, as could be explained by the ‘poor get poorer’ model or the upward social comparison theory (Festinger, 1954). In addition, where social support-seeking and perceived social support were associated with reduced depression (Frison & Eggermont, 2015a; 2016a; 2017), this was linked to perceived social support, which can be explained by the main effects hypothesis that theorises that high social support is beneficial.

All studies looking at emotional aspects of SNS use were on Facebook or general SNS, and there was low risk of bias in the measures used. One study only was longitudinal, therefore causation could not be established amongst most studies.

**2.5.4 Communication aspects of SNS use**

When considering forms of expression or feedback on SNS, online feedback with a positive tone was associated with positive wellbeing whereas negative feedback was associated with negative wellbeing (Valkenburg et al., 2006). Wang et al. (2017) found higher authentic self-presentation to be associated with reduced depression, mediated by perceived social support that reduced the tendency to ruminate. The latter finding is in line with the uses and gratifications theory (Katz , Blumler, & Gurevitch, 1973) and the self-determination theory (Deci & Ryan, 1985) whereby people satisfy the psychological need for connection through SNS use (Raacke & Bonds-Raacke, 2008), which when achieved through authentic self-presentation and subsequent perceived social support and reduced rumination, improves wellbeing. This supports previous findings in adults (Grieve & Watkinson, 2016; Kim & Lee, 2011). Direct comparisons between these two cross-sectional studies in this review is not appropriate given the different measures and different SNS use variables used, but conceptually they both indicate that supportive feedback, direct or perceived, is beneficial, whereas direct negative feedback is detrimental. Both studies used reliable measures thus risk of bias was low for both.

**2.5.5 Profile features of SNS use**

Another aspect of SNS use that studies investigated was profile features. There were gender differences in the associations between both reported social self-concept and self-esteem, and with having or not having a SNS profile (Blomfield Neira & Barber, 2014). In fact, Bloomfield Neira and Barber (2014) found that for males, having a profile was positively correlated with social self-concept, while for females, having a profile was associated with lower self-esteem and higher depressive symptoms. This is consistent with other studies on SNS use and depression (Pantic et al., 2012) and self-esteem (Vogel et al., 2014) in high school students and undergraduates, respectively. The positive impact on self-concept in males could be explained by the augmentation hypothesis, such that using the site provides more opportunities for developing social skills. Also, creating an identity, seeking online connections and perceiving social support can enhance relationships and thus wellbeing. The negative impact on depression and self-esteem in females may be explained by the increased opportunities for negative feedback through SNS use leading to reduced wellbeing, or via upward social comparison. Gender differences may relate to the differences in social skills, and differences in motives for SNS use, as suggested in Frison and Eggermont (2016a).

**2.5.6 Limitations of the papers included in the review**

The main findings need to be interpreted in the context of the methodological limitations. Most studies were cross-sectional and therefore it was not possible to determine the direction of possible causality between SNS use and wellbeing. The widespread use of convenience sampling, common in this field of research, may limit generalisability to adolescents from other locations and cultures. Additionally, some included studies focused on individual SNS platforms which limits the generalisability of these findings to other platforms. All but one study used self-report data collection methods, which raises the risk of information bias via recall bias, regarding time spent on SNS or frequency of SNS use questionnaires. Responses may also have been confounded by a social desirability bias, given that some measures included emotional content.

Generally, where reported, the majority of SNS measures were of good internal consistency thus indicating good reliability. However, some studies did not report on reliability of measure therefore there was a risk of measurement bias which reduces internal validity of the findings from these studies. Additionally, some of these studies relied on single-item measures and future studies should rely more on multi-item scales. The overall reliability and validity were considered to be higher for outcome measures than for the SNS use measures. There was a wide heterogeneity in measures used for SNS use and for wellbeing outcomes making clear comparisons between studies difficult, therefore studies were grouped by appropriate SNS use themes in the discussion. It was noted that several studies found gender differences in relation to the impact on wellbeing consistent with previous research. However, not all studies adjusted for gender as a confounding variable.

**2.5.7 Limitations of this review and future directions**

Given the recent emergence of literature around SNS use and adolescents’ wellbeing, inclusion criteria for this review were deliberately broad and it was accepted that this could result in a high degree of heterogeneity in variables. Future reviews would benefit from focusing on specific variables to allow for better comparison across studies, but further research is needed first. This review employed robust processes in the systematic search across three databases. Some studies may nevertheless have been missed. Additional databases, grey literature and searching of other sources of references were not undertaken due to time constraints thus limiting the opportunity to find all relevant studies. The participant age criterion for study inclusion was fixed as the mean age of the participants being 18 years or younger, resulting in a wider age range than this in some studies. This may limit the generalisability to adolescent populations because some participants may have been considered young adults or pre-teen children. This mean age criterion also excluded potentially relevant studies given that Sawyer, Azzopardi, Wickremarathne, and Patton (2018) have recently proposed adolescence to extend from 10 to 24 years old. Future reviews should also consider exploring specific age ranges within adolescence. This review included only quantitative studies, and further insight into the relationship between SNS use and wellbeing would have been gained through inclusion of qualitative studies.

**2.6 Conclusion**

This review examined recent research on the impact of SNS use on adolescent wellbeing and analysed 16 studies published between 2006 and 2019. Several themes were explored such as temporal, emotional and communication aspects of SNS use, and active and passive types of use. Although there were mixed findings within these themes, this review highlighted that higher usage of SNS and passive SNS use were more often associated with negative impacts on wellbeing. In relation to types of use, gender differences were apparent as were mediating roles of perceived social support and co-rumination. Considering emotional aspects of SNS use, more positive or negative attitudes and online behaviours were relevant to differential impact on wellbeing. Additionally, authenticity of self-presentation and positive tone of received feedback was associated with higher wellbeing and negative feedback with reduced wellbeing. This literature review suggests that the relationship between SNS use and wellbeing amongst adolescents is multifactorial and not straightforward, and further research will have to include hypothesis-driven experimental designs if elements of it are to be teased apart. This will be important to provide guidance as to how adolescents can use SNS helpfully rather than harmfully. There is scope for improvement in the reliability and validity of measures, particularly SNS use measures. Future studies could consider more objective data collection methods such as diaries, and SNS content analysis in addition to self-report, to provide more comprehensive information whilst reducing risk of bias. Greater understanding of the factors affecting wellbeing outcomes would help protect adolescent mental health through informing both psychological health policies around SNS use and guidance for health professionals, parents, carers, educators and individuals.

**3. Passive and active Facebook use in adolescents: Impact on mood depending on level of social anxiety**

**3.1 Abstract**

The prevalence of Facebook use leads to concern that it may impact on adolescent wellbeing.Nearly 1 in 3 adolescents will meet criteria for an anxiety disorder by the age of 18 years. Social anxiety (SA) may predispose people to developing additional mental health difficulties, so adolescents with SA may have increased vulnerability to potentially negative consequences of Facebook use on mood. This experimental study used a mixed design to compare the immediate effect of active and passive Facebook activities on mood, in adolescents with low or high levels of SA. The results showed no difference between adolescents with low or high SA in their reported active and passive Facebook use. Passive Facebook use did not increase negative mood in the experimental condition. There was no effect of SA, or type of Facebook use, on mood following the experimental task. However, we found that both positive and negative mood decreased after Facebook use. The decline in positive mood across all participants in this study may have more serious consequences for those with higher SA. These results indicate that mental health conditions such as SA may not significantly influence the effect of Facebook use on mood. Other factors may have a stronger influence, such as adolescents’ developmental need for social connection, and also SNS content viewed. It may be important to look at SNS more widely and to explore motivations for use and specific activities within active or passive use for their impact on mood.

**3.2 Introduction**

Social Networking Sites (SNS) have become increasingly popular over the last decade particularly amongst adolescents (see Systematic Review for statistics on prevalence of SNS use). Facebook, with more than 2 billion daily active users (Facebook statistics, 2017) remains the most visited social media platform, reaching 90% of the UK internet audience, and a total of 41 million internet users aged 13+ (Ofcom, 2018). As a result, Facebook has received a large amount of attention in research on SNS. In the US, 71% of 13-17 year olds use Facebook (Lenhart, 2015). The ‘EU Kids Online’ survey reported that 15-16 year olds spend 118 minutes per day online (O’Neill et al., 2011) and were reported to spend an average of 21 minutes on their Facebook site (Orosz, Toth-Kiraly, & Bothe, 2015). SNS is therefore highly integrated in many adolescents’ lives (Yang & Brown, 2013) and this level of usage adds to the concern that it may impact on adolescent wellbeing (Young, Kuss, Griffiths, & Howard, 2017).

Previous research on the consequences of SNS use has employed a variety of wellbeing measures, for example mood, depression and life satisfaction (Keyes, Ryff, & Shmotkin, 2002), although within the literature, the terms ‘subjective wellbeing’, ‘psychological wellbeing’ and ‘wellbeing’ are often used interchangeably. This study drew on research into the consequences of Facebook use on emotional wellbeing and specifically focused on mood rather than life satisfaction. Herein, mood (as assessed by self-report questionnaire) will be used to indicate emotional wellbeing. The aim of this study was to improve our understanding of how high or low social anxiety (SA) may impact adolescents’ mood after using SNS actively or passively, in order to support recommendations for Facebook use to avoid low mood.

**3.2.1 Adolescent development and mental health**

Adolescence is a developmental period marked by an increased importance of peer relationships, displacing parental relationships as the main source of social support (Brown & Larson, 2009). During this period, feeling socially connected with others is important (Beyens, Frison, & Eggermont, 2016) as adolescents develop their social interaction skills. Higher levels of social connectedness are linked to decreased feelings of anxiety, depression and loneliness (Wu, Outley, Matarrita-Cascante, & Murphrey, 2016). Facebook therefore provides an ideal platform to satisfy adolescents’ need to belong (Nadkami & Hofman, 2012). However, given that much of adolescents’ social and emotional development now occurs online, their limited capacity for self-regulation can result in negative consequences (O’Keeffe & Clarke-Pearson, 2011). This provides further rationale for researching the impact on adolescents’ mood given that this is the first generation to have grown up with online social networking.

Another reason for focusing on adolescence is that the onset of many mental health difficulties occurs during this period (Kessler et al., 2005). The prevalences of these difficulties have been reported in the Children’s Mental Health Report (2017); there is a two-fold increase in depression and bipolar disorder from age 13 to 18 (from 8.4% to 15.4%), and nearly 1 in 3 adolescents will meet criteria for an anxiety disorder by the age of 18. Anxiety disorders are the most prevalent of these difficulties amongst adolescents (Hill, Waite, & Creswell, 2016), and there is high comorbidity between depression and anxiety (Garber & Weersing, 2010). Depressive symptoms in adolescence can predict depression in adulthood (Pine, Cohen, Cohen, & Brook, 1999). Therefore, it is important to understand how social media use may affect the mental health of adolescents.

SA is one of the most common anxiety disorders that occurs in adolescents (Children’s Mental Health Report, 2017) and typically emerges during early adolescence (American Psychiatric Association, 2013). SA has been described by Leary (1983) as “a state of anxiety resulting from the prospect or presence of interpersonal evaluation in real or imagined social settings” (p. 67) and includes a range of symptoms which can vary throughout one’s lifespan. SA can be considered to exist on a continuum with social phobia at the more extreme end and shyness at the other end (Shepherd & Edelmann, 2015). Shyness is considered more likely to be associated with one’s temperament and therefore is more consistently experienced across the lifespan. Adolescents are particularly vulnerable to developing SA as during adolescence there is increased emphasis on the importance of social and peer relationships (Biederman et al., 2001). Given that people with SA may be at higher risk of developing additional mental health difficulties (Chhabra, Bhatia, Gupta, Kumar, & Srivastava, 2009), adolescents with SA therefore may have increased vulnerability to potentially negative consequences of Facebook use on mood.

**3.2.2 Social anxiety and Facebook use**

Adolescents with SA may be more motivated to interact online rather than offline (Caplan, 2007; Weidman et al., 2012). The theory of social compensation, which states that socially anxious individuals prefer interacting with people online to compensate for their anxiety experienced during offline interactions (Van Zalk, 2016), can explain the behaviour of those with SA in regard to social media. It is likely that those with high SA would feel more comfortable interacting online, than offline. This has been reported by Fernandez, Levinson, and Rodebaugh (2012) and Weidman et al. (2012) in undergraduates. Social media has also been shown to provide benefits for adults with SA (Indian & Grieve, 2014).

Clark and Wells’ (1995) cognitive model of SA in which SA is considered a morbid fear of negative evaluation by others, may also explain why people with SA use Facebook, and also how they may use it. In social situations, the anxiety cycle is perpetuated by increased self-focus which can interfere with one’s ability to attend to a situation and can potentially elicit those feared outcomes. People with SA often struggle in social situations due to their desire to make a good impression which raises their anxiety, and this often leads to avoidance of social interactions. SA therefore impacts interpersonal relationships (Shaw, Timpano, Tran, & Joorman, 2015; Weidman & Levinson, 2015). Facebook offers a social context providing increased anonymity, reduced visual cues, and greater control over time and pace (McKenna & Bargh, 2000), characteristics that are more appealing for people with SA as they allow for greater control over self-presentation and avoidance of anxiety (Erwin, Turk, Heimberg, Fresco, & Hatula, 2004).

This cognitive theory may also contribute to understanding different styles of Facebook use. Active use refers to interactions between the user and Facebook friends such as liking or commenting on others’ posts, whereas passive use refers to viewing one’s newsfeed or others’ profiles (Frison & Eggermont, 2016a). Socially anxious individuals are likely to fear negative judgements from others during online interactions. Once the anxiety cycle is triggered (e.g. someone posting on their wall), they become increasingly self-focused on how to respond, triggering anticipatory anxiety. This would lead to the use of safety behaviours in the form of passive rather than active use, which could include posting fewer photographs and status updates (Weidman & Levinson, 2015). This is supported by a cross-sectional study by Shaw et al. (2015) amongst adults, which found that higher SA correlated with passive use of Facebook. These individuals may be subject to the negative effects on mood from passive use (Verduyn et al., 2015). Thus, it would be expected that adolescents with high SA will report more frequent passive Facebook use then those with low SA. Additionally, it is therefore likely that socially anxious individuals would experience reduced mood if instructed to use Facebook actively, against their normal tendencies. However, to our knowledge no studies have yet tested this idea.

**3.2.3 Active and passive Facebook use**

Social comparison has been proposed as a potential mediator between active and passive Facebook use and the effects on wellbeing (Hanna et al., 2017). Social comparison is based on a theory outlined by Festinger (1954) in which individuals are driven to evaluate their opinions and abilities, and use external information to make these evaluations. Facebook is considered to be a platform which facilitates such social comparisons (Hanna et al., 2017). Furthermore, users of Facebook tend to present positive, more favourable experiences in their life on their Facebook account (Lin & Utz, 2015), and therefore upward social comparison is more likely in young people who may compare their own lives with the lives of Facebook friends. Passive use presents more opportunities for social comparison and thus negative psychological consequences (Appel, Gerlach, & Crusius, 2016; Ceglarek & Ward, 2016; Chen & Lee, 2013; Feinstein et al., 2013; Jang, Park, & Song, 2016; O’Keeffe & Clarke-Pearson, 2011).

Additionally, using Facebook passively may reduce offline social activities due to spending less time having face-face interactions with friends and family, and thus impact on the development and maintenance of social relationships (Nie, 2001). This has been described as the social displacement hypothesis (Kraut et al., 1998), originally applied to internet use, but has since expanded to SNS use. In support of this, ‘surfing’ the internet, similar to passive use of Facebook, has been strongly associated with Internet Addiction Disorder (Yang & Tung, 2006) and has been associated with depression and anxiety in a study by Selfhout, Branje, Delsing, ter Bogt, and Meeus (2009).

In relation to active use, the social enhancement or ‘rich get richer’ hypothesis may predict beneficial effects of active use of Facebook. This hypothesis suggests that socially competent adolescents, or those with higher friendship quality offline, use Facebook as another platform to socialise with peers and maintain friendships (Kraut et al., 2002), through the use of more active features of Facebook, and has gained support from Valkenburg & Peter (2009), Van Zalk (2016) and Yoo and Jeong (2017). Socially competent individuals may experience more positive effects on their wellbeing from Facebook (Morgan & Cotton 2003; Selfhout et al., 2009). Alternatively, the ‘poor get richer’ aspect of social compensation (Valkenburg, Schouten, & Peter, 2005) in which adolescents with lower quality friendships who struggle more in face to face interactions, may benefit from actively using Facebook, as it offers opportunities to interact with people in a safer online environment where they can develop social skills and experience positive effects on wellbeing (Valkenburg & Peter, 2007b).

**3.2.4 Types of Facebook use and mood**

Previous research on Facebook use and adolescent mood can be found in the Systematic Review. Research on overall Facebook use and emotional wellbeing outcomes have been mixed, and this inconsistency may be due to the difficulty in defining and measuring the concept of Facebook use, considering its many different features (Gerson, Plagnol, & Corr, 2017).Facebook use has typically been assessed with, for example, measures of self-estimates of time spent on Facebook, or number of log-ins, which do not capturehow users engage with the site. To highlight this, studies measuring Facebook intensity (Ellison et al., 2007; Valenzuela et al., 2009) found positive associations between Facebook use and life satisfaction, whereas studies measuring time spent on Facebook (Kross et al., 2013; Vigil & Wu, 2015) revealed contradictory findings. This supports the importance of taking into account how people are using Facebook, and recently, interest has focused on the positive and negative effects of active and passive Facebook use (Deters & Mehl, 2013).

Cross-sectional studies have found passive use to reduce wellbeing (Chen et al, 2016; Krasnova et al., 2013; Krasnova, Widjaja, Buxmann, Wenninger, & Benbasat, 2015; Kross et al., 2013; Tandoc, Ferrucci, & Duffy, 2015). On the other hand, active use was found to correlate positively with wellbeing (Kim, Chung, & Ahn, 2013; Kim & Lee, 2011; Lee, Lee, & Kwon, 2011). Burke et al. (2010) found passive use was associated with increased loneliness, and reduced social capital, whereas active use had the opposite associations. Additionally, Ellison et al. (2007) reported an increase in social capital with active use, whilst Grieve et al. (2013) reported an increase in social connectedness. An experimental study by Deters and Mehl (2013) found active use on Facebook to increase social connectedness and reduce loneliness. These indicators of wellbeing are both relevant in adolescent development. The literature suggests that Facebook use can have positive implications for mental health when used to develop social identity or to foster positive social interactions, but can have detrimental effects when used passively for social comparison (Ceglarek & Ward, 2016).

Few studies have looked at SA and type of Facebook use. Shaw et al (2015) found SA to correlate with passive use, but not active use, whilst supporting Murphy and Tasker (2011) in their positive association between SA and time spent. McCord, Rodebaugh, and Levinson (2014), contrary to their expectations, found that SA did not negatively correlate with active use. Instead, they found an association between greater SA and more self-reported anxiety about using Facebook actively. These cross-sectional designs make it difficult to infer direction of causality in these associations, therefore further experimental designs are recommended (Best et al., 2014).

Of the few experimental studies that have investigated active and passive Facebook use, Deters and Mehl (2013) found that active use of Facebook (posting more status updates) over a week led to participants feeling less lonely compared to those in the ‘Facebook as usual’ condition. However, active use did not affect subjective happiness or depression. Another experimental study by Sagioglou and Greitemeyer (2014), in adults, found that active use of Facebook (over a 20-minute Facebook task) led to a reduction in users’ depressed mood immediately after the task, compared to the control conditions of internet browsing and offline activity. In another experimental study in young adult females (Fardouly et al., 2015), participants instructed to use Facebook passively reported increased negative mood compared to participants visiting a control website. Wise, Alhabash, and Park (2010) differentiated passive use further into newsfeed browsing and social searching (visiting friends’ profiles), and the latter was associated with more pleasant feelings. In an experience sampling study by Verduyn et al. (2015), participants instructed to use Facebook passively for 10 minutes reported no difference in affective wellbeing compared to those instructed to use Facebook actively. However, passive use predicted a decrease in affective well-being when assessed at the end of the day compared to how they felt initially and immediately after the task, and compared to those in the active Facebook condition. All of these experimental studies were in young adult or undergraduate samples (all older than 18 years).

**3.2.5 Aims and hypotheses**

A number of gaps in the literature have been outlined. There are inconsistent, even opposing, findings on the effect of Facebook use on emotional wellbeing, and studies have mostly been in undergraduates or adult populations. Although this research has moved towards investigating the impact of types of Facebook use rather than time spent on Facebook, these are mostly cross-sectional studies which cannot determine causality. Furthermore, the few experimental studies that have been carried out have used undergraduate or adult populations. To our knowledge, there are no experimental studies that evaluate the relationship between SA, passive or active Facebook use, and effects on mood in adolescents. Adolescents are particularly vulnerable to potentially negative consequences on mood, especially given the prevalence of Facebook use and the potential emergence of anxiety and depression during this time of life. The current study therefore investigated the impact of active and passive (passive newsfeed browsing and passive social searching) Facebook use on immediate mood in adolescents with low and high SA, using an experimental design. The study design was based on the experiment used by Verduyn et al (2015), but with the addition of SA as a factor impacting type of use, and immediate mood, as well as in a different age group. The focus of this study is on positive and negative affect and therefore the Positive and Negative Affect Scale (PANAS; Watson et al., 1988) will be an appropriate scale to use to measure immediate affect.

The four hypotheses are stated below. Hypotheses 2, 3, and 4 are linked to the experimental intervention used in the study.

Hypothesis 1: Adolescents with high SA will report more frequent passive Facebook use than those with low SA.

Hypothesis 2: Passive use of Facebook, but not active use of Facebook, will negatively impact mood in adolescents.

Hypothesis 3: Passive newsfeed browsing will result in a greater increase in negative mood than passive social searching.

Hypothesis 4: Adolescents with high SA will experience a greater increase in negative mood than those with low SA in the active use condition compared to either of the passive conditions.

**3.3 Method**

**3.3.1 Participants**

Participants included 98 thirteen to 18-year olds (38.8% males, 53.1% females, 8.2% non-disclosed) with an active Facebook account (*M* = 14.81, *SD* = 1.45) from five state-funded Nottinghamshire schools, recruited through convenience or opportunistic sampling. Participants were white British (66.3%), White other (14.3%), Pakistan (7.1%). Asian (7.1%), Black Caribbean (1%), with 4.1% undisclosed. Ethnicity appeared relatively representative of the Mansfield and Nottingham populations from which participants were recruited, where white British is the majority ethnic group at 97.1% and 71.5%, respectively (Office for National Statistics, 2011). Recruitment was first through schools who were given an information sheet inviting them to participate (Appendix A); participating schools were asked to send information and consent sheets to parents and guardians who had the opportunity to refuse participation via opt-out forms (Appendix B). Each participant provided informed consent via Qualtrics (Appendix C) at the start of the survey. All participants were advised that they could withdraw at any time. Initially, 158 participants were recruited and were grouped into ‘low’, ‘medium’ and ‘high’ SA groups according to cut off scores on a SA measure (described below). For the purpose of this study, only participants in the ‘low’ (n = 42) and ‘high’ (n = 56) SA groups were included for the analyses.

**3.3.2 Ethical approval**

The study was approved by the Royal Holloway, University of London Research Ethics Committee (Appendix D). All participants received a verbal and written debrief, and were directed to consult a GP, Samaritans or Childline if they felt they needed support.

**3.3.3 Power calculations**

The G power program (Erdfelder, Faul, & Buchner, 1996) was used to calculate the estimated sample size of N = 150, based on 0.80 Power, p ≤ .05 in a 3x2x2 mixed ANOVA to find a small to medium effect size of .15 (effect sized based on Verduyn et al., 2015). The final sample used in the analyses was 98 participants. The study was therefore underpowered.

**3.3.4 Exclusion criteria**

Data were initially collected from 158 participants in total, although 8 participants’ data were removed due to incompletion of the Facebook task, as a result of inability to access Facebook accounts on the day, or discontinuing the survey. Participants in the ‘medium’ SA group (n = 54) were excluded therefore 98 participants’ data was used in the analyses. For each analysis, participants were included only where 95% of data was complete.

**3.3.5 Measures and materials**

Adolescents completed four self-report measures as well as a ten-minute Facebook task, which were delivered online via Qualtrics Survey Software. A stop watch was required to time the ten-minute Facebook task. Participants also required access to a computer and mouse.

*SA measure*

A 20-item Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) measured participants’ level of SA (Appendix E). Participants indicated their agreement with statements on a 5-point Likert scale (ranging from 0 = not at all, to 4 = extremely). Sample items include “I am tense mixing in a group” and “I have difficulty making eye contact with others”. Three items were reverse coded. Total scores ranged from 0-80, with higher scores indicating the presence of more anxiety. Participants were grouped into low (score of 20 and below), medium (scores ranging from 21-33), and high (score of 34 and above) SA based on the recommended cut off using the SIAS scale. This has been found to differentiate between clinical and non-clinical levels of SA (Brown, Turovsky, Heimberg, & Juster, 1997; Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992). The SIAS has been found to have high internal consistency with a Cronbach’s alpha of (McCord et al., 2014; Weidman et al., 2012) and test-retest correlations were reported as .92 indicating high reliability (Mattick & Clark, 1998). A Cronbach’s alpha of .94 was found in this study sample. As highlighted above, we were interested in establishing both a low and a high SA group. A t-test was run to check that the two groups differed in mean SIAS scores; there was a significant difference, with the low SA group (*M* = 12.75, *SD* = 4.31) scoring lower on the SIAS measure than the high SA group (*M* = 43.95, *SD* = 8.73), t(55.94) = -21.3, p < .001.

*Mood measure*

The 20-item Positive and Negative Affect Scale (PANAS; Watson et al., 1988), comprising 10 items each for positive mood (e.g., excited, enthusiastic) and for negative mood (e.g., upset, nervous), was used to assess participants’ mood before and after the Facebook task (Appendix F). The PANAS time frame was amended for the purpose of this study and participants were asked to “indicate what extent you feel this way right now, that is, in the present moment”. For the second PANAS that was administered immediately after the Facebook task, instructions were amended to include an additional comment “we know that you already completed this one, but please complete it again. Think about how you feel at the present moment.” Participants indicated their agreement with these items on a 5-item Likert response scale (ranging from 1 = very slightly or not at all, to 5 = extremely). A total score is calculated by the sum of the 10 terms on the positive affect (PA) scale (10-50) and the sum of the 10 terms on the negative affect (NA) scale (10-50). The PANAS was used by Sagioglou et al. (2014) to assess emotional states and has good validity (Merz et al., 2013; Watson et al., 1988). The internal consistencies of the PANAS scales were good (Crohnbach’s alpha: PA .89; NA .85) in non-clinical student samples (Watson et al., 1988). Similar consistencies of the PANAS scales were found in this study sample at time 1 (Cronbach’s alpha: PA .89; NA .87) and time 2 (Cronbach’s alpha: PA .92; NA .91).

*Depression measure*

The Centre for Epidemiologic Studies Depression scale (CESD; Radloff, 1977) is a 20-item measure for non-clinical settings that assessed depressive symptoms over the past week (Appendix G); this was included as a control variable when looking at change in mood, given the high comorbidity with SA (Garber & Weersing, 2010) and the likelihood of it being related to mood. Participants were required to respond on a 4-point Likert scale (ranging from 0 = rarely or none of the time, to 3 = most or all of the time). Sample items include, “I felt depressed”, and “I thought my life had been a failure”. Four items were reverse coded, and total scores ranged from 0-60, with higher scores indicating the presence of more depressive symptomatology. The CESD has strong psychometric properties with adolescents (Roberts, Andrews, Lewinsohn, & Hops, 1990) and has demonstrated excellent internal reliability (alpha = .87) and good convergent validity in high school and college students (Phillips et al., 2006; Radloff, 1991). A Cronbach’s alpha of .88 was found in this study sample.

*General Facebook use measure*

In this study, a range of questions were asked about participants’ usage, features of use, and motivations of use, informed by previous studies (Kross et al., 2013; Oldmeadow, Quinn, & Kowert, 2013; Shaw et al., 2015; Verduyn et al., 2015). Participants’ usage of Facebook was assessed using four questions: first, to provide descriptive information (“how many SNS do you use?” and “which SNS do you most frequently use?”; participants provided number); second, to assess frequency of use (“How often do you use Facebook?”); responses ranged from less than once a month [1] to several times a day [7]); third, amount of time spent on Facebook (“on average, how long do you spend on Facebook each time you log on?”); responses ranged from 15 minutes or less [1] to 3 hours or more [7].

Participants’ usual use of active and passive features of Facebook was assessed using Frison and Eggermont’s (2015b) 10-item Multidimensional Scale of Facebook use, with an additional two items added (Appendix H). This 12-item scale (seven items on active use and five on passive use, including two items on passive social searching) measured the frequency of active and passive use using a 7-point Likert scale (ranging from 1 = never, to 7 = several times per day). Sample active Facebook use items include, “How often do you post a photo on your own Facebook timeline?”, “How often do you post something else (e.g., a picture or video) on your own Facebook timeline?” Two additional items assessed further aspects of active Facebook use, “How often do you ‘share’ someone else’s post or video?” and “How often do you 'like' or comment on someone else's post?”. Sample passive Facebook use items include, “How often do you browse your news feed”, “How often do you look at photos of a Facebook friend”. Based on the average of the items of each dimension, mean active and mean passive estimates were created. In this study sample, a Cronbach’s alpha of .82 and .88 were calculated for active use and passive use scales, , respectively.

Participants’ motivation for using Facebook was assessed by asking them to indicate whether they used Facebook “to keep in touch with friends”, “to find new friends”, “to share good things with friends”, “to share bad things with friends”, and “to obtain new information”. These items were taken from Verduyn et al. (2015). However, participants were asked to rank these statements in order of personal relevance, rather than on a Likert scale, as in Verduyn et al. (2015) study.

**3.3.6 Design**

This experimental study used a mixed design to compare the immediate effect of active and passive Facebook activities on mood in adolescents with low or high levels of SA in a non-clinical population. The dependent variable was self-reported mood (two mood measures assessing positive affect and negative affect).

**3.3.7 Procedure**

Participants sat at individual computers in the school’s computer suite, with individual participant numbers to ensure confidentiality. Students received verbal and written information about the study and were given the opportunity to ask questions and provided informed consent. Participants were informed that their Facebook use and questionnaire responses would be anonymous to minimise demand effects on questionnaires. They were advised to seek support from the researcher or teacher, and reminded to answer questionnaires anonymously. At the end, participants were thanked and given a debrief (Appendix I). The study took approximately 50 minutes.

Participants first completed demographics (Appendix J), then SIAS, from which participants were allocated by Qualtrics programming to one of three Facebook conditions. They then completed PANAS and were requested to wait for on-screen instructions regarding the experimental Facebook task, to ensure the same start time*.* In the activeFacebook use condition, participants were instructed to “spend 10 minutes using Facebook for direct communication: for example, posting status updates, commenting on posts, sharing or liking others’ posts, updating profile, or sending messages” and were reminded that they could choose which of the active features to use. Participants in the passive newsfeed browsing condition were instructed to “spend 10 minutes browsing through your own newsfeed”. They were instructed “not to ‘react’ to or share any posts, or post any status updates, and to only scroll through and read the posts that are viewable on your newsfeed”. Those allocated to the passive social searchingcondition were asked to “spend the next 10 minutes browsing through your friends’ newsfeed”. They were instructed “not to ‘react’ to or share any posts, or post any status updates, but to simply go to a friend’s newsfeed and browse through the posts that are viewable”. For verbatim instructions, see appendices K, L and M. The 10-minute task was timed using a stopwatch. A time stamp on the page monitored the time individuals spent on Facebook to check participants’ compliance with the task. After the Facebook task, participants completed the mood scale (PANAS) again. They then ticked which active or passive Facebook features they had used during the task (Appendix N), for example, “posted a status update”, “browsed my newsfeed” and reported the content viewed on their newsfeed (Appendix O) as percentages, for example, “funny memes”, “content that is upsetting”. Features used and content viewed were randomly presented. Participants then completed the CESD and answered three general Facebook use questions; frequency, active and passive Facebook, and motivations for use (Appendix P). These questionnaires were also randomised to reduce response effects.

**3.3.8 Pilot study**

A pilot study to test the protocol was conducted with a group of 15 UK secondary school pupil volunteers. Ethics approval was granted following the Royal Holloway, University of London Research Ethics Committee procedures. The pilot Facebook task was 15 minutes, based on previous studies (Fardouly et al., 2015; Sagioglou et al., 2014), but participants reported boredom and distraction therefore it was revised down to 10 minutes. A question to assess newsfeed content viewed during the task was added following pilot feedback, in case this affected immediate mood. Wording of measures was deemed age-appropriate.

**3.4 Results**

**3.4.1 Missing data**

Participants with more than 5% missing data on measures were excluded from that particular analyses (see Appendix Q) as Schafer (1999) stated that a missing rate of 5% or less is inconsequential. For all dependent variables (mood scores), missing scores were imputed by calculating the participants’ mean score on other items on that scale.

**3.4.2 Outliers**

Outliers, scores 3*SD* greater than the mean (based on recommendations of Field, 2009), were identified for dependent variables through the use of boxplots. For positive mood, there were no outliers identified at time 1 and at time 2. For negative mood, there was one outlier identified at time 1 (*M* = 15.93; *SD* = 7.40) and four at time 2 (*M* = 13.52; *SD* = 6.15). For Facebook use variables, there were no outliers in mean active or mean passive use. Outliers were not excluded in any analyses.

**3.4.3 Normal distribution**

In order to assess that data are normally distributed a z-test test of skewness and kurtosis was conducted for each dependent variable. Normality was not an issue for positive mood at time 1 and time 2, passive Facebook use and active Facebook use (scores were within the critical value cut-off points from -3.29 to 3.29 for sample sizes between 50 and 300; Kim, 2013). However, scores on negative mood at both time 1 (skewness z = 7.89, kurtosis z = 10.38) and time 2 (skewness z = 10.35, kurtosis z = 17.45) differed substantially from normality. As such, normality will be addressed when reporting the analyses.

**3.4.4 Demographics**

Demographics by anxiety group are presented in Table 3.1. Snapchat was the most used SNS (see Figure 3.1) in low SA (64.3%) and high SA (45.2%), yet Facebook was reported to be used several times a day (low SA: 28.6%; high SA: 23.8%) (Appendix R) for 15 minutes or less at each login (Appendix S). The most commonly reported motivation for use was ‘to keep in touch with friends’ (Appendix M).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 3.1 |  |  |  |  |  |  |  |
| *Percentage Distribution of Demographic Variables of Participants in Low and High Social Anxiety Groups* | | | | | | | |
|  | Low Social Anxiety Group (n = 56) | | High Social Anxiety Group (n = 42) | | *t* | *X2* | df |
| Age |  | |  | | 1.98 |  | 96 |
| Range | 13-18 | | 13-18 | |  |  |  |
| Mean (SD) | 15.05 (1.38) | | 14.48 (1.49) | |  |  |  |
| Gender |  | |  | |  | .45 | 90 |
| Male | 42.90% (N = 24) | | 33.30% (N = 14) | |  |  |  |
| Female | 50% (N = 28) | | 57.10% (N = 24) | |  |  |  |
| Non-disclosed | 7.10% (N = 4) | | 9.50% (N = 4) | |  |  |  |
| Ethnicity |  | |  | |  |  |  |
| White British | 53.60% (N = 30) | | 83.30% (N = 35) | |  |  |  |
| White Other | 16.10% (N = 9) | | 11.90% (N = 5) | |  |  |  |
| Black Caribbean | 1.80% (N = 1) | | 0% (N = 0) | |  |  |  |
| Pakistani | 12.50% (N = 7) | | 0% (N = 0) | |  |  |  |
| Asian | 12.50% (N = 7) | | 0% (N = 0) | |  |  |  |
| Missing | 3.60% (N = 2) | | 4.80% (N = 2) | |  |  |  |
| CESD |  | |  | | -5.5\* |  | 60.99 |
| Mean (SD) | 11.71 (1.01) | | 23.35 (11.79) | |  |  |  |
| Missing | 8.50% (N = 5) | | 4.80% (N = 2) | |  |  |  |

\**p< .001*

*Figure 3.1*. Most frequently used SNS type for low and high SA groups

**3.4.5 Differences in demographic variables between low and high SA groups**

Analyses were run to determine whether there were any significant differences between the low SA and high SA groups on demographic variables (Table 3.1). There were no significant differences in age, or gender, all ps >.4. However, there were more females in the high anxiety group (N = 24) than males (N = 14), in line with the literature on prevalence rates of anxiety (Children’s Mental Health Report, 2017). There was a significant difference between the groups in depressive symptoms on the CESD with a higher mean score in the high SA group than the low SA group. This is expected as comorbidity is common amongst adolescents (Garber & Weersing, 2010) and therefore to preserve ecological validity, participants were included in the analysis regardless of their self-reported depressive symptoms on the CESD.

**3.4.6 Mood variables**

For all mood dependent variables at time 1 and time 2, independent t-tests were conducted to examine differences between the low and high anxiety groups (Table 3.2). A Bonferroni correction was applied and a significant difference was accepted when the p value was less than .0125. The independent t-test for negative mood at time 1 remained significant after the correction (p = .008).

Table 3.2.

*T-tests Investigating Differences in Positive and Negative Mood across Low and High Social Anxiety Groups*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Low Anxiety Group  (n = 49) | | High Anxiety Group  (n = 40) | | t-test | |
|  | *M (SD)* | | *M (SD)* | | *t* | df |
| Positive Mood |  |  |  |  |  |  |
| Time 1 | 28.89 (9.47) | | 24.78 (9.08) | | 2.15 | 95 |
| Time 2 | 26.87 (11.23) | | 24.14 (9.09) | | 1.24 | 87 |
| Negative Mood |  | | | | | |
| Time 1 | 14.13 (5.73) | | 18.37 (8.62) | | -2.74\* | 95 |
| Time 2 | 12.05 (3.94) | | 15.33 (7.75) | | -2.43 | 87 |

\**p* < .0125

**3.4.7 Findings for hypotheses**

**Hypothesis 1: Adolescents with high SA will report more frequent passive use than those with low SA.**

An independent-samples t-test was performed to determine if there were significant differences in active and passive Facebook use scores between participants with low and high SA. All variables were normally distributed, as assessed by Kolmogorov-Smirnov’s test (*p* > .05), except for mean passive Facebook use scores were in high SA group (*p* = .003). As sample sizes were large enough (>30), and the independent t-test is fairly robust to deviations in normality, the parametric test was used. Homogeneity of variances was met. The t-tests showed no significant difference in mean active Facebook use score in the low SA group (M = 2.89, SD = 1.23) compared to the high SA group (M = 3.12, SD = 1.47), t(87) = -.53, and in mean passive Facebook use score in the low SA group (M = 3.12, SD = 1.47) compared to the high SA group (M = 2.92, SD = 1.61), t(87) .61, all ps > .10. Thus, hypothesis 1 was not accepted.

**Hypothesis 2: Passive use of Facebook, but not active use of Facebook, will negatively impact mood in adolescents.**

**Hypothesis 3: Passive newsfeed browsing will result in a greater decrease in mood than passive social searching.**

**Hypothesis 4: Adolescents with high SA will experience a greater increase in negative mood than those with low SA in the active condition compared to either passive condition.**

A three-way mixed ANOVA was conducted to understand the effects of SA group, Facebook condition, and time of data collection on positive and negative mood scores separately. This analysis will address hypotheses 2, 3 and 4. Means and standard deviations are reported in Table 3.5.

*Positive mood:*

Normality was assessed for each combination of the groups of the two between-subject factors, SA (low, high) and Facebook condition (Active use, Passive newsfeed browsing, Passive social searching), for both levels of the within-subject factor, time (Time 1 and Time 2). All groups were normally distributed as assessed by Kolmogorov-Smirnov’s test (*p* > .05). No outliers were identified. There was homogeneity of variances at time 1 (*p* = .554) and time 2 (*p* = .137).

There was no main effect of Facebook condition on positive mood, *F*(2, 83) = .06, *p* = .95, ŋp2 = .001, P = .06. There was no main effect of SA group, *F*(1, 83) = .251, *p* = .12, ŋp2 = .03, P = .35 There was a significant main effect of time, *F*(1, 83) = 4.39, *p* = .039, ŋp2 = .05, P = .54. Positive mood decreased from pre-task (*M* = 26.98, *SE* = 1.02) to post-task (*M* = 25.48, *SE* = 1.13) after the Facebook task. This was a medium effect size (Cohen, 1988).

Contrary to expectations, there was no significant interaction between time and Facebook condition, *F*(2, 83) = .151, *p* = .86, ŋp2 = .004, P = .07. Thus, for positive mood, hypothesis 2, that following Facebook use there will be a decrease in mood, was not accepted, as there was no decrease in positive mood after passive Facebook use. Hypothesis 3 was also not accepted. Further, there was no three-way interaction between time, Facebook condition and SA, *F*(2, 83) = .34, *p* = .712, ŋp2= .008, P = .10. There were no other two-way interactions that were significant; all ps > .40. Thus, hypothesis 4 was not accepted.

Table 3.5.

*Means and Standard Deviations for Dependent Variables across all levels of Independent Variables*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Active Facebook use | | | | Passive Newsfeed Browsing | | | | Passive Social Searching | | | |
| Low Social Anxiety  (n = 17) | | High Social Anxiety  (n = 14) | | Low Social Anxiety  (n = 18) | | High Social Anxiety  (n = 15) | | Low Social Anxiety  (n = 14) | | High Social Anxiety  (n = 11) | |
| *M(SD)* | | *M(SD)* | | *M (SD)* | | *M (SD)* | | *M (SD)* | | *M (SD)* | |
| Positive mood |  |  |  |  |  |  |  |  |  |  |  |  |
| Time 1 | 30.09 (10.62) | | 23.93 (9.59) | | 29.33 (8.51) | | 25.13 (10.27) | | 27.24 (10.02) | | 26.18 (7.18) | |
| Time 2 | 26.75 (12.13) | | 23.29 (11.57) | | 27.72 (10.73) | | 14.6 (7.36) | | 25.93 (11.49) | | 24.61 (8.43) | |
| Negative mood |  |  |  |  |  |  |  |  |  |  |  |  |
| Time 1 | 15.65 (6.48) | | 20.14 (9.04) | | 13.61 (5.71) | | 16.27 (10.24) | | 11.79 (2.12) | | 19.64 (5.12) | |
| Time 2 | 13.41 (5.66) | | 16.93 (10.27) | | 11.56 (3.00) | | 13.07 (5.69) | | 11.02 (1.56) | | 16.36 (6.27) | |

*Negative mood:*

Negative mood was only normally distributed in time 1 in low and high SA groups, in the active condition. All other variables were not normally distributed, as assessed by Kolmogorov-Smirnov (*p* < .05)[[2]](#footnote-2). Five outliers were identified but not excluded[[3]](#footnote-3). There was homogeneity of variances for negative mood scores at time 1 (*p* = .095) but not at time 2 (*p* = .001).

There was no main effect of Facebook condition, *F*(2, 83) = 1.82, *p* = .17, ŋp2 = .04, P = .37. Negative mood did not significantly differ between those in the active Facebook condition compare to those in either passive Facebook conditions. There was a main effect of SA group, *F*(1, 83) = 10.37, *p* = .002, ŋp2 = .111, P = .89; negative mood was significantly higher in those with high SA (*M* = 17.07, *SE* = .98) than low SA (*M* = 12.84, *SE* = .88). This was a medium effect size. There was a significant main effect of time, *F*(1, 83) = 27.92, *p* <.001, ŋp2 = .25, P = .99. This was a large effect size. Negative mood significantly decreased from pre-task (*M* = 16.18, *SE* = .75) to post-task (*M* = 13.73, *SE* = .64) after the Facebook task.

As with positive mood, there was no significant interaction between time and Facebook condition, *F*(2, 83) = .21, *p* = .81, ŋp2 = .005, P = .08. Thus, for negative mood, hypothesis 2, that following Facebook use there will be a decrease in mood, was not accepted, as there was no decrease in negative mood after passive Facebook use. Hypothesis 3 was also not accepted. Further, there was no three-way interaction between time, Facebook condition and SA, F(2, 83) = .25, p = .779, ŋp2 = .006, P = .09. There were no other two-way interactions that were significant, all ps > .10. Thus, hypothesis 4 was not accepted.

**3.4.8 Secondary analyses**

Participants may not have used Facebook as instructed, which may explain the lack of main effect for Facebook condition and interaction between Facebook condition and mood over time. After the Facebook task, participants indicated the features of Facebook they had used from a list of all features involved in the three Facebook conditions. A variable was computed based on participants’ score on this question. Participants were coded as ‘passive’ users if they did not tick any of the 7 active Facebook features. Participants were coded as ‘active’ users if they scored 1-7 on the active Facebook features. Scores on the passive features were not included as all active use involves some passive features. Counts revealed that 92.5% of those who were instructed to use Facebook actively, did so, but 7.5% used it passively instead. In contrast, 61.3% of those who were instructed to use Facebook passively did so, whereas 38.7% used it actively instead. These findings justified performing secondary analyses using actual, rather than instructed, Facebook use as the Facebook condition variable, to more accurately reflect how participants engaged with the task.

*Hierarchical multiple regression*

*Positive mood*

A hierarchical multiple regression was run to determine if the addition of actual Facebook use and SA together improved the prediction of the outcome variable (positive mood) at time 2. Positive mood at time 1 was put in block 1 as the control variable, and actual Facebook use and SA were put in block 2. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.284. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1, and VIF < 10, and no correlations >.8. There was one studentized deleted residual greater than -3 standard deviations, but this was a genuine value and less than 5% of cases so remained in the data. There were no leverage values greater than 0.2, and values for Cook’s distance above 1. The assumption of normality was met, as assessed by Q-Q plot. The addition of actual Facebook use and social anxiety group to the prediction of positive mood at time 2 (Model 2) led to a non-significant increase in R2 of .006, F(2, 85) = .721, p = .489. Thus, only positive mood at time 1 was a significant predictor of positive mood at time 2 (Model 1) R2 of .617, F(1, 87) = 140, p < .001, adjusted R2 = .61.

*Negative mood*

A hierarchical multiple regression was also run to determine if the addition of actual Facebook use and SA together improved the prediction of negative mood at time 2. Negative mood at time 1 was put in block 1 as the control variable, and actual Facebook use and SA were put in block 2. All assumptions were met as for the hierarchical multiple regression for positive mood. There was one studentized deleted residual greater than +3 standard deviations, but this was less than 5% of cases therefore remained in the data. Similar results were found; the addition of actual Facebook use and SA group to the prediction of negative mood at time 2 (Model 2) led to a non-significant increase in R2 of .001, F(2, 85) = .007, p = .993. Thus, only negative mood at time 1 was a significant predictor of negative mood at time 2 (Model 1) R2 of .663, F(1, 87) = 171.08, p < .001, adjusted R2 = .66.

**3.5 Discussion**

This study investigated how the association between active and passive Facebook use and mood differed for adolescents with high or low social anxiety (SA). It also investigated whether SA influenced adolescents’ typical Facebook use (active or passive). The results showed no difference between adolescents with high SA or low SA in their reported active and passive Facebook use, contrary to expectations that high SA would lead to greater passive use. Moreover, passive Facebook use did not increase negative mood in the experimental condition, in those with either high or low SA. Unexpectedly, but importantly, there was no effect of SA, or type of Facebook use (active, passive browsing, passive social searching) on mood following the experimental task. Thus, unlike the prediction, those with high SA did not experience a greater decrease in mood than those with low SA after active Facebook use, compared to either type of passive Facebook use. Consequently, there was no difference between the two passive uses of Facebook in their impact on mood across both SA groups.

Although research on SA and type of SNS use is sparse, the study findings differ from those of Shaw et al. (2015) who reported that high SA was associated with more passive Facebook use in adults, but they align with McCord et al. (2014) who found no association between SA and reduced active Facebook use. Interestingly, in this current study we found that the reported frequencies of active use and passive use were highly correlated (*r = .76, p* < .001)despite expecting adolescents with high SA to report a preference for passive use. It appears that these adolescents are engaging equally in both active and passive Facebook use, not influenced by SA. One explanation may be that adolescents use Facebook to reduce boredom (Spaeth, Weichold, & Silbereisen, 2015) and so the influence of high or low SA would not be detectable. More likely though, is that adolescents, given their developmental need for connectedness, may browse their newsfeed and friends’ profiles so as to be updated about others’ lives, which may remind them of their social network and friendships, and reinforce their sense of belonging (Nadkami & Hofmann, 2012).

The drive to form and maintain relationships is a common motivator of Facebook use (Seidman, 2013) and this was in line with adolescents in this study who reported the main motivation for Facebook use was to keep in touch with friends. Adolescents with high SA, who we expected would use Facebook more passively than actively due to a fear of judgement, as explained by the cognitive model of SA, may in fact use Facebook as actively as those with low SA, in order to meet their developmental needs. Therefore, if adolescents commonly use Facebook both actively and passively for social connectedness, mood would not be negatively affected after passive use. In this experiment, passive use did not negatively impact mood, whether or not an individual had high SA. This was in contrast to previous cross-sectional (Krasnova et al., 2015; Tandoc, Ferrucci, & Duffy, 2015) and experimental research (Saglioglou & Greitemeyer, 2014) which found passive browsing to be associated with lower subjective wellbeing in adults (Saglioglou & Greitemeyer, 2014), and in adolescents (Wenninger, Krasnova, & Buxmann, 2014), possibly related to upward social comparison (Appel et al., 2015).

Given this prior research, we predicted that upward social comparison during passive use would negatively impact mood, particularly in those with high SA as they are more vulnerable to negative cognitive biases (Østergaard, 2017), and because social comparison may be more common in adolescents than in adults (Krayer, Ingledew, & Iphofen, 2008; Myers & Crowther, 2009). Therefore, findings from this current study on passive use and mood were surprising and may be due to changes in newsfeed content in recent years (Zuckerberg, 2018). There has been a noticeable increase in the number of advertisements on Facebook, displacing previous newsfeed pages predominantly made up of friends’ status updates and photos. This reduction in peer content may have reduced participants’ opportunities for upward social comparison. It is also possible that adolescents are using other SNS, to view the personal content from friends (Lenhart, 2015) that is now less available on Facebook, thus passive browsing on Facebook would not necessarily lead to social comparison and subsequent reduced mood. Supporting this proposition, in this current study Snapchat and Instagram were ranked as more popular than Facebook. Furthermore, it is important to consider how quickly SNS usage patterns change amongst users and since the study was designed, Facebook use amongst adolescents has decreased whilst Instagram and Snapchat use has risen. According to the most recent reports on SNS usage in this age group, Facebook is now the third most popular site in teenagers with Snapchat being the most popular followed by Instagram (Statista, 2019), which reflects what participants reported in this study.

In the main analysis investigating interactions between SA, type of Facebook use and mood, we found a significant and surprising change in mood after Facebook use, in that both positive and negative mood decreased. Previous experimental studies found Facebook use to have an immediate negative effect on mood using the PANAS measure (Berry, Emsley, Lobban, & Bucci, 2018; Sagioglou & Greitemeyer, 2014). Sagioglou and Greitemeyer (2014) found that the effect on mood was mediated by a feeling of not having done anything meaningful. The overall reduction in positive mood in this current study may be due to similar reasons, although we did not assess this. Verduyn et al. (2015) in their experimental study in undergraduates only found a significant decrease in mood at the end of the day, rather than immediately after the experiment. They postulated that this could be due to participants having had a chance to ruminate on social comparisons they made during the experimental task. A delayed effect could have occurred in this current study, but mood was only assessed before and immediately after the Facebook task. However, given their tendency to ruminate and overstate potential negative impressions from others offline (Mansell & Clark, 1999) those with high SA may be more likely to experience a delayed effect on mood. The lack of a third time point in this study may offer an alternative explanation for the non-statistically significant interaction between Facebook use and mood over time.

In contrast to other studies that found a negative impact on mood, the reduction in negative mood in this study may be related to the content viewed on Facebook during the experiment. Viewing entertaining posts or funny memes on their newsfeed or friends’ profiles could have enhanced mood through emotional contagion, in which others’ expressed emotions online can influence an individual’s mood (Ferrara & Yang, 2015). Funny memes were indeed reported to have been viewed most on people’s newsfeeds in this current study. However, the confounding factor of novelty, from having permission to access Facebook in class, could also have improved participants’ mood. Additionally, as participants were working in close proximity, offline emotional contagion from peers (Neumann & Strack, 2000) could have influenced mood in either direction. It is likely that the laboratory environment of this study did not reflect real life experiences of using Facebook and may offer an alternative explanation for the lack of statistically significant interaction between Facebook use and mood over time. Importantly, the concomitant decline in positive mood across all participants in this study may have more serious consequences for those with higher SA, given that they had lower initial mood than those with low SA. Although SA may not have influenced the effect of type of Facebook use on mood in this study, the low mood associated with high SA could put these individuals at higher risk of potential negative impact on mood. Depressive mood has been shown to predict clinical depression later in adulthood (Pine et al., 1999).

For the main investigation of interactions between SA, type of Facebook use and mood, we predicted that for those with high SA, being instructed to use Facebook actively would decrease mood more than for those instructed to use it passively. The reasoning was that high SA would induce anticipatory anxiety about negative feedback online following their active use, which would increase negative mood. McCord et al. (2014) found an association between high SA and increased self-reported anxiety about using Facebook actively. It was predicted that those with high SA typically engage in passive use, as a safety behaviour, so when instructed to use Facebook actively they may experience elevated anxiety. Additionally, high SA is associated with higher susceptibility to social comparison due to negative cognitive bias, which would also negatively affect mood in either passive or active use (Booker et al. 2018). However, this study found no effect of the type of Facebook use or level of SA on mood, either for instructed or actual Facebook use (as reported in secondary analyses). Similarly, Berry et al. (2018), in adults with and without psychosis, unexpectedly found that psychosis did not moderate the relationship between specific types of Facebook use and mood. These results indicate that mental health conditions such as SA may not significantly influence the effect of Facebook use on mood. Other factors may have a stronger influence, such as adolescents’ developmental need for social connection, which may be met effectively through SNS use, and also SNS content.

**3.5.1 Limitations and future directions**

Several limitations have been identified which can direct future research. The study did not have sufficient power to detect a small to medium effect size, which may exist in the population; further testing is needed. Post hoc power calculated on SPSS for each effect demonstrated that this study had low power for all effects found in this study apart from the main effect of time (P = .99) and main effect of SA (P = .89) in negative mood. This experimental study lacked a control condition, such as internet browsing or Facebook as usual (Deters & Mehl, 2013; Sagioglou & Greitemeyer, 2014). However, activities undertaken by the control group would need to be taken into account to ensure any effect is from the experimental condition. Taken together, future research should be sufficiently powered, with the addition of a control group to determine whether any change in mood was due to Facebook use, or merely time or boredom. The laboratory conditions of this experiment probably differed from real world experiences of using Facebook, and responses may have been influenced by emotional contagion from peers. It is important to consider the validity of measures used. The self-report measure of SIAS has been shown to discriminate between non-clinical and individuals with generalised social phobia (Mattick & Clarke, 1989) and is commonly used in adult populations (Kashdan & Herbert, 2001). Fergus, Valentiner, McGrath, Gier-Lonsway, and Kims’ (2012) short form of SIAS, which selected items for readability, could be more appropriate for adolescents.

One key limitation is that mood was measured immediately after using Facebook; however, we know from other research that in some cases effects only emerged later in the day (see Verduyn et al., 2015). Therefore it is not clear if effects may emerge later. Future experimental and longitudinal research should use additional time points to detect later onset of changes in mood. The active/passive Facebook use measure, although used in other studies (Frison & Eggermont, 2015a; 2016a) was non-standardised and may not reflect the evolving features of Facebook use. Researchers should therefore keep up to date with the evolving features and usage of SNS when developing measures. The reliance on self-report measures, commonly used in this field, raises risk of social desirability, information and reporting biases. Future research could employ more ecologically valid experience sampling methods, for example daily diary entries, involving repeated assessment of variables over a specified time-period (Berry et al. 2018; Kross et al., 2013; Verduyn et al., 2015) which may capture both immediate and delayed effects. This may also reduce the confounder of social contagion when participants complete questionnaires in a group setting. Additionally, tracking of SNS behaviours through activity logs (Ophir et al., 2019) provide more valuable information on types of use and content viewed, which could be important in evaluating the impact of SNS use on mood. It seems that Facebook was not the main SNS used by adolescents in this study and therefore it may be important to focus future research on the most popular SNS or on SNS more widely to assess how adolescents are feeling after using SNS.

**3.5.2 Implications**

The reduction in positive mood after Facebook use should alert providers and users of SNS of potential negative consequences of SNS. This was a non-clinical sample without social anxiety diagnoses therefore future research is needed to understand the potentially worse consequences in clinical populations. However, the reduction in negative mood indicates possible benefits. The different outcomes may depend on pre-existing mood, motives for use, and content viewed on SNS. This study highlights the need for further research to identify the more beneficial or harmful SNS activities, and the more vulnerable users. This supports the Royal Society for Public Health (2017) statement that SNS platforms should reach out to at-risk users, which may include those with high SA, and offer signposting to appropriate support options. Clinically, therapists should be encouraged to assess clients’ SNS use for its impact on presenting difficulties, and include it in formulations that may guide treatment interventions. Researchers and clinicians need to keep abreast of current research in this field given the evolving nature of SNS features and usage.

**3.6 Conclusion**

In this study, SA did not influence the type of Facebook use that adolescents reported using, nor did it moderate the impact of active or passive Facebook use on mood, suggesting that other factors may be influencing whether Facebook use is beneficial or harmful. These factors may include motivations for using Facebook, such as meeting the need for social connectedness, and SNS content viewed. It may be important to look at SNS more widely, as Facebook’s popularity among adolescence is declining, and to explore specific activities within active or passive use, with more reliable measures of usage or with tracking online behaviours. This was a study in a non-clinical population and future research should include clinical populations to provide a better understanding of whether SNS use may elicit or exacerbate mental health difficulties in different people.

**4. Integration, Impact and Dissemination**

**4.1 Integration**

Since beginning my career in Clinical Psychology I have worked with adolescents experiencing mental health difficulties, and the role of social networking sites (SNS) has been a common issue raised by these individuals during therapy sessions. I appreciate that the current adolescent generation may be significantly affected by currently unknown long-term consequences of the prevalence of SNS use, with communication styles moving from offline to online. I hoped that the review would provide useful insight that could influence guidance or intervention for vulnerable adolescents on how to use SNS to promote and maintain wellbeing, and to minimise risk of mental health difficulties. It would be helpful if guidance could be given on how to use SNS in a way that is consistently beneficial for all, including those with pre-existing poor mental health or potential vulnerability to poor wellbeing, such as adolescents. I also hoped that the findings from my empirical study as well as those studies reviewed in the systematic review, would guide future research that addresses limitations as far as possible, and thus bring researchers closer to a comprehensive understanding of the multiple factors involved in the impact of SNS on mental health.

**4.1.1 Reflections on the systematic review**

For the systematic review I chose to search for quantitative studies only, as these would allow me to understand the current evidence for associations between SNS use and wellbeing, and this would potentially support decisions for the focus of my empirical paper. The review process was interrupted by my 11-month maternity leave, which resulted in my having to perform a second database search on my return to the course. An issue I initially noted was the vague nature of the term wellbeing in the literature, but deliberately I chose a broad research question which I felt would enable me to appreciate the wide range of possible effects of SNS use on adolescents, and again, help me to subsequently narrow down my research question for the empirical paper.

Most research into effect of SNS on wellbeing has been with adults; research on the effects on adolescent wellbeing is more limited. In the studies that met the inclusion criteria there was a fair degree of heterogeneity in the way SNS use was characterised and measured. There was also some heterogeneity in the wellbeing outcomes and associated outcome measures, but to a lesser degree. The heterogeneity made comparisons between studies more difficult and thus made definite conclusions about the precise effects on adolescents’ wellbeing of different parameters of SNS use hard to elucidate. A meta-analysis using statistical techniques to quantify relationships, would lead to clearer results for each SNS use parameter and wellbeing outcome but with the wide heterogeneity in these key variables, the decision was made to do a narrative review rather than a meta-analysis.

Most studies used self-report measures which may introduce biases into the data. For these cross-sectional investigations into the impact of SNS use on wellbeing, these measures still enable broad associations to be made, but when investigating these associations for direction of causality, more objective measures would be more scientifically useful. These issues compromised the reliability and validity of the systematic review results and made final conclusions more difficult to reach. It was also more difficult therefore to be precise concerning detailed suggestions for future research, although general recommendations were possible. Overall, the review highlighted the issue of a lack of consistency and standardisation of measures of SNS use, and of potential adolescent age and gender differences in responses to various types of SNS use (Lai et al., 2018; Frison & Eggermont, 2016a). Also highlighted was the limited number of longitudinal studies; these would add to our understanding of the chronology and duration of any effects of SNS use on wellbeing. My rationale for the empirical paper was therefore to focus on a particular SNS (Facebook), specific types of SNS use (active and passive use), and investigate associations between type of use and mood, with SA as a potential moderator of any effects. I chose to use standardised measures for the main variables (SA and mood) to overcome some of the limitations of the cross-sectional research in the systematic review. During the process of my research, I became aware of my preconceptions that SNS use would have an overall negative impact on adolescent wellbeing, and this may have been influenced by my past conversations with adolescents in my clinical work. Reading the literature and seeing the balance between the beneficial and negative impacts of various aspects of SNS, made me realise the value of conducting systematic reviews to obtain a fairer picture of the current knowledge in the field.

**4.1.2 Reflection on the Empirical Study**

The empirical research involved an experimental Facebook task and was carried out with due regard to ethical issues, such as consent, safety and confidentiality. It was important to consider the ethical issues in regard to not using all of the data collected after removing the ‘medium’ social anxiety group. However, due to the design of the study in that all participants completed all measures and the experimental task at the same time, it would have been difficult, and potentially unethical to ask those who scored within the ‘medium’ cut off on the social anxiety measure to discontinue the study and leave the classroom. This was further decided against due to the practicalities of conducting research in an adolescent population during a school lesson as students would not have been able to leave the classroom. To address this ethical issue, it was discussed with teachers and they felt that it was beneficial for all students to take part as a learning experience of being involved in Psychological research and how it is carried out. All participants were debriefed at the end of the study and given the opportunity to ask questions and discuss the research, for example, the process of conducting research, and the background to the study they had completed.

My study involved looking at mood changes after Facebook use, and through searching the literature I became aware of the challenge for researchers looking at emotions, mood and affect due to the conceptual issues relating to the definition and measurement of these constructs. These constructs have often been used interchangeably but attempts have been made to define these concepts more clearly (Batson, Shaw, & Oleson, 1992; Beedie, Terry, & Lane, 2005). As Ekman and Davidson (1984) described, emotions are generally more intense feelings that may have been triggered in response to a stimulus and can be more transient in nature. Mood tends to be less intense and of longer duration than emotions and does not necessarily need a contextual stimulus or the stimulus may not have occurred immediately before. Emotions and moods influence each other as an emotion can lead to a mood state. Affect encompasses both emotions and moods. It is important when conducting research to select an appropriate measure that supports the specific aim of the research study as the constructs measured will influence the conclusions drawn. In my empirical study, I intended to measure the impact of Facebook use on immediate mood, therefore the PANAS was chosen as it is a measure of two primary dimensions of mood, known as positive and negative affect. This scale, which contains items relating to a range of emotions, can capture subtle changes in people’s mood states over a shorter period of time and was therefore appropriate to use before and after a 10 minute Facebook task as in my study.

I had not fully appreciated the ambitious nature of conducting experimental research in schools. The experimental design was based on that of Verduyn et al. (2015) in University students. This prior research had used a Facebook task period of 15 minutes but in the pilot study for my research, the participants’ main recommendation was to reduce this time period to ten minutes to reduce boredom and distraction from the task. This change was made.

Another reflection arose during the recruitment period, as recruitment proved to be more difficult than I had anticipated. Although many schools were approached through links with Child and Adolescents Mental Health Services (CAMHS), a number of them declined to participate due to reluctance around disruptions to timetables and not wishing to permit Facebook use in school time on school equipment. This was surprising given the recognition in schools of mental health difficulties and the prevalence of SNS use amongst their students. However, I responded to these difficulties by employing a snowballing sampling method once I had one school willing to participate. This resulted in five schools who agreed to take part, but this method of recruitment meant that schools were clustered within one county and thus limited the generalisability of findings. All participating schools offered several classes across the age range to do the study, but the promised number of classes did not materialise for school-related reasons such as staff illness, school residential trips and lack of availability of the computer suite. This resulted in a smaller sample size and hence the study did not have sufficient power to detect a small to medium effect size, but it demonstrated the reality of conducting experimental research in schools. Reflecting on the procedural aspects of this research, which I felt were carefully designed, it transpired that participating schools would only allocate timetable time to the research in tutor sessions. There were some issues with students’ arrival times into the computer suite, possibly due to the tight timetables in secondary schools. Without the benefit of a prior relationship with staff or students, making a timely start to the experiment was sometimes difficult, which resulted in some participants not being able to complete the full study. Additionally, computer technology systems had to be set up by schools in advance of my sessions to prevent students using personal log-ins on the school network except through a global researcher login. This sometimes resulted in delays to the start of the session.

My research for this study was based on theories such as social comparison (Festinger, 1954), but it became apparent during the experimental process that there was possibly some emotional contagion from being in a room with peers rather than being alone to do the task and questionnaires, and this was particularly pertinent as some students were excited by the fact that they were not usually allowed to use Facebook in school. Therefore the findings related to participants’ mood before and after the experiment need to be tentatively interpreted. Further research is needed to confirm the outcomes, using more objective measures such as diary entries, which would enable later onset of mood changes, as found by Verduyn et al. (2015), to be detectable.

Despite some of the difficulties and frustrations I experienced, the results of my study were interesting, albeit unexpected. I was unable to accept any of the hypotheses, although the theories behind social media use were relevant for the hypotheses. I explored potential interpretations for the results in the empirical paper. One key finding was that SA did not in fact moderate the impact of Facebook use on mood, with either active or passive use. This was surprising given the theories around psychological processes and the research showing negative effects of passive use on mood (Frison & Eggermont, 2016a). It appears that the adolescents im my study use Facebook both actively and passively, with approximately equal frequency, and may primarily use Facebook for social connection rather than social comparison. Therefore, research needs to enquire more closely into adolescents’ habitual SNS use, and individuals’ motives for use, alongside investigating how these factors affect mood, whether immediately or after different time periods.

Another finding from my empirical study has potential implications. Positive affect decreased from pre-task to post-task in my experiment, for all participants (those with high SA and those with low SA) and in all types of Facebook use. For those with high SA, whose initial mood may be low, this may increase their risk of very low mood from short term Facebook use (and potentially from use of other SNS). While confounding factors may have been operating in my study, such as emotional contagion, and while further research into this finding is needed, the potential for reduced mood needs to be known and understood by youth, parents, carers, health practitioners, educators, so that SNS use does not exacerbate or lead to mental health difficulties.

**4.1.3 Integration of both studies**

Over the two papers, better understanding of the impact of SNS use on adolescent wellbeing could have emerged, with the empirical study taking a much more focused approach by considering the relevance or otherwise of SA in relation to different patterns of Facebook use and changes in mood. There are far fewer studies on the impact of SNS on adolescent wellbeing than there are on young adults and older adults. This is surprising given that adolescence is a stage of significant developmental change where diagnoses of mental health problems appear to increase (Natsuaki et al., 2009) and a stage during which SNS use begins and remains at a high level (Lenhart, 2015). Overall, both the systematic review and the empirical study yielded mixed results in relation to the research questions. Broadly speaking, the review highlighted that increased time spent, and passive usage of SNS were more often associated with negative impacts on wellbeing, whereas authenticity of self-presentation and perceived social support led to more positive outcomes. Gender differences were apparent, although current evidence is limited. While the empirical study yielded results that did not support the hypotheses, the findings indicated the need for closer investigation into the factors moderating the impact of SNS on mood. In theory, SA may indeed have a role to play in the very short-term impact of SNS use on mood in adolescents, but this needs to be researched further in order to obtain valid and reliable results.

**4.2 Impact**

Impact has been defined as ‘an effect on, change, or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia’ (BPS, 2018). From my research findings, the impact would be in the form of suggestions for information and guidance that could be given to adolescents, parents, carers, health professionals and educators, regarding the current evidence on risks and benefits of SNS use. Given the mixed outcomes of the review and the surprising findings of the research study, very specific and targeted guidance is difficult to construct at this stage. The main outcome is that there needs to be greater awareness of the significant potential for harmful and beneficial effects on mood of using Facebook and other SNS, as drawn from the systematic review.

In relation to academic impact, I have offered suggestions for how future research could be designed to move methodologies forward as most research in this area has been cross-sectional and relied on self-report data. These suggestions included using experimental and longitudinal designs, using experience sampling methods and daily report data (Pempek, Yermolayeva, & Calvert, 2009) to examine individual differences in SNS use and associated outcomes. Furthermore, I suggested the use of SNS tracking equipment to be able to provide more accurate data on exactly how participants are using SNS and what content they are viewing. These advances in methodology may enable a better understanding of the underlying mechanisms involved in the relationship between SNS use and psychological health.

In relation to economic and societal impact, this research, particularly the findings from the systematic review, can be used to share the differential effects of SNS use on adolescent wellbeing and educate individuals, as well as organisations and society, on the links between SNS use and wellbeing. For example, the negative associations found in the systematic review between passive use of SNS, time spent on SNS, and wellbeing, can be shared with users, as well as parents and guardians, teachers, educational psychologists, and psychological health professionals, with the aim of increasing awareness of potential harmful effects of using these sites on adolescent wellbeing. Parents may benefit from guidance and evidence-based recommendations regarding use of SNS to aid discussions with their children around their use of SNS. It is reported that 55% of parents report limiting their children’s’ time spent online at home (Anderson, 2016). Clinical health professionals may benefit from this knowledge to inform their clinical practice with adolescents, given the research highlighting the centrality of SNS in adolescents’ lives. Clinicians might wish to ask about adolescents’ SNS use in their assessments and incorporate psychoeducation regarding SNS use and possible consequences on mood and wellbeing. Clinicians may draw on the findings highlighted in the systematic review to raise awareness in adolescents and their families, and to develop more personalised interventions to help adolescents identify any attitudes or behaviours related to SNS use that could be adversely affecting their mental health. It is likely that individuals with pre-existing mental health difficulties such as depression or anxiety may have more negative cognitive biases which can impact their use SNS and the effects of their use on their mood.

The instrumental impact of these studies relates to how this research can influence policy, practice and service provision, as well as shaping behaviour. The mixed findings from the systematic review regarding the impact of SNS on adolescent wellbeing makes it difficult to reach any definitive conclusions with enough robust evidence to inform wider policy guidelines at this stage. However, given the increase in studies in this area and the potential for further research to elucidate the different factors that may be influencing how adolescents are affected by their use on SNS, as suggested in the empirical study, it would be important for this research to contribute to these guidelines. Future research is needed first, and then systematic reviews and meta analyses of these studies would hopefully be able to provide better evidence for causal links that could support the development of government guidelines for users and parents and guardians to promote safe SNS use in order to reduce mental difficulties in young people and promote wellbeing. This should be a priority given that adolescents aged 11 to 19 with a mental health condition were more likely to use SNS (NHS Digital, 2018), and it is likely that SNS use is contributing to the rise in mental health difficulties resulting in increased demand on adolescent mental health services. NHS mental health services are struggling to cope with this increased demand, with a recent report (NHS Digital, 2018) stating that there were 389,727 active referrals to mental health service across services in England for people aged 18 or younger. CAMHS have tightened their referral criteria, thus leaving a large proportion of adolescents below the cut off and unable to access support from these services. Adolescents may instead seek online support from peers, which could be helpful if they perceive social support (as noted in the findings of the systematic review) but could also be detrimental if social support is not perceived, or if online feedback was negative. Given the rising demand for mental health support for adolescents, and the mixed findings on the positive and negative impact of SNS use on adolescent wellbeing, the British Secretary for Health and Social Care put forward an investigation into the links between SNS use and young people’s mental health. An interim report from this review (Annual Report of the Chief Medical Officer, 2018) proposed a practical step of greater regulation of social media to facilitate protection and safeguarding young people’s mental health. In line with this, a ‘duty of care’ has been proposed for SNS, which requires SNS providers to obtain a license for their site to be used in the UK. Findings from my systematic review may contribute to these types of policy developments.

Our findings from both the empirical paper and the systematic review do highlight the need for adolescents, who are developmentally more vulnerable to potential negative effects of SNS use, to be educated on the risks or benefits of SNS use. Subsequently, this might increase awareness of their own SNS use, particularly how they are using the sites, their motivations for using the sites and the type of content they are viewing. Both the systematic review and our empirical study discussed the theory of social comparison (Festinger, 1954), and the higher tendency for adolescents to engage in upward social comparisons on SNS which may partly explain the negative consequences on wellbeing in some individuals (Chou & Edge, 2012, Steers, Wickham, & Acitelli, 2014). Therefore, raising awareness of these theories may elicit reflection in users about how they engage with SNS and this subsequently may lead to behaviour changes that benefit users’ mood. For example, if users are made aware of research suggesting benefits on mood after active use of SNS, through connecting with friends, and notice their tendencies to use SNS more passively and engaging in social comparison, they may adapt their usage and behaviours. Increased awareness of the potential negative impact of SNS use may be particularly helpful for those who report to use Facebook for fear of missing out (Beyens et al., 2016). It has also been shown that some users have an expectation of feeling better after using Facebook and in fact feel worse after use (Sagioglou & Greitemeyer, 2014) therefore education on how particular usage of SNS may lead to negative outcomes could be beneficial for these individuals. Practical strategies may include users turning off notifications on SNS, not using SNS before bed, and limiting time spent on SNS per day, to regulate their current usage patterns as recommended by Frost and Rickwood (2017).

Our empirical study explored the impact of SNS use within a non-clinical population of adolescents with social anxiety, and although our findings showed that SA did not influence mood after SNS use, future research is needed in this area as it remains important to raise awareness in users with pre-existing mental health difficulties that it is not yet fully understood how their current difficulties may impact on their SNS use and mood. In summary, the findings from the empirical paper can contribute to the existing literature supporting other studies in high school students that have not found any significant impact of aspects of SNS use on wellbeing outcomes (Banjanin et al., 2015; Jelenchick et al., 2013; Blomfield Neira & Barber, 2014). However, given the limitations discussed and the possibilities for future directions, it may contribute to future studies and research that could have a greater potential for impact.

**4.3 Dissemination**

It is important that all research findings should be disseminated. This includes inconclusive findings or findings that are not statistically significant, as in my empirical study. Disseminating such findings should contribute to future research questions and improved methodological designs, as already discussed. In this case it is crucial that the potential for harm from Facebook use is made known, so that adolescents, parents and guardians, schools and universities, and health professionals, are more aware of the role that SNS use may have in the development or exacerbation of adolescent mental health disorders.

The impact may be achieved on a wide scale through posters placed in a range of settings such as schools, GP waiting rooms, youth club venues, and Universities. Any document designed for such dissemination should provide knowledge from current research to raise awareness about the risks and benefits of SNS use on mood. Other outlets could be through journal articles and in the media (newspapers, online websites, SNS platforms), and through public engagement such as education in schools which could lead to both immediate and incremental impact. A summary of these research findings will be provided to participating schools.

Given the lack of conclusive findings in either direction from the systematic review, and the non-significant associations in the empirical study, impact would initially be focused on raising awareness, possibly extending this to influencing policy development and guidelines after further research. To explore the impact of increasing awareness, data may show reductions in SNS use, or changes in how adolescents are using the sites, and potentially reductions in associated mental health difficulties or improvements in adolescent self-reported wellbeing. There may also be an increase in media coverage on the topic, and potential responses from the SNS platforms to the raised concerns, such as increasing access to their data for research purposes as well as making adaptations to their sites with young people’s mental health and wellbeing at the forefront of these decisions. SNS providers may consider ways of using research findings to guide their development of features on their platforms as well as integrating guidance on safe ways to use their platforms within their sites.

**4.3.1 Publication**

The research will be considered for submission to Computers in Human Behavior journal.

**4.3.2 Other**

This research will be shared with the participating schools through a summary of the main research findings, by offering a presentation to the students and staff, or through provision of a poster.

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**6. Appendices**

**6.1 Appendix A: Information sheet for schools**



**Dr Dawn Watling**

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My name is Debbie Jagger and I am a Trainee Clinical Psychologist studying for a Doctorate of Clinical Psychology at Royal Holloway, University of London. I am carrying out research for my Doctoral thesis under the supervision of Dr Dawn Watling.

I am writing to invite you to take part in an exciting new project which will investigate how adolescents use Facebook and whether this is influenced by the way they think and feel in different social situations. It will also assess the immediate effect of Facebook use on mood in adolescents. Below you will find some information about the research and what we can offer you and your school if you were to take part.

**What is the purpose of this study?**

This study aims to extend prior research on Facebook use, a common social networking site amongst adolescents. Recent research has focused on the potential negative effects of social media (including Facebook) on young people’s wellbeing and mood, but there has been little research on the immediate effects of Facebook on mood. Adolescence is a critical period for the development of mental health problems and given the popularity of Facebook amongst adolescents, adolescents may be particularly vulnerable to the potentially negative consequences of Facebook use.

Hopefully this project will contribute to the work being done to reduce mental health issues amongst adolescents.

**Why have you been invited to take part?**

We would like a number of schools to take part from a variety of demographic areas and we are aiming to recruit 150 participants between the ages 13 and 18.

**What will you, or your school, get out of taking part?**

At the end of the study, you will receive a report or presentation on the findings of the study. I am also happy to offer to give a talk about studying Psychology at University if this would be of interest to your students.

**What would taking part involve for the school?**

We would ask that parents of students invited to take part are sent an information and opt-out letter so that they can opt out of the research study on their child’s behalf. We would ask the school to send this letter to parents 1-2 weeks prior to the research session booked.

I am hoping to collect data from up to 150 students (13-18 year olds). If it was possible to recruit a large number of students from one school, then multiple sessions may be required. We would ask, for each session, that we may have 30 minutes in a computer suite in which the students would complete questionnaires on a computer and then carry out a 10 minute Facebook task, followed by completing some further questionnaires at the end. All questionnaires are completed online (using Qualtrics) so there will be no paper copies and everything will be done in the one session, with the data stored securely and electronically, in one place.

**What will the pupil get from taking part?**

Students will be contributing to research aiming to investigate how adolescents’ use Facebook and the immediate effects of Facebook on mood. Students, and the school, will receive a summary report or verbal presentation on the findings of the study at a later date. Importantly, in the event that someone is experiencing difficulties, we will inform students about who they can contact as part of the debrief at the end of the research session.

**What would taking part involve for the pupil?**

In the 30 minute session, students will be asked to complete a set of questionnaires on the computer that will take approximately 10 minutes. They will then be asked to carry out a 10 minute Facebook task with instructions on how to use Facebook during that time. Following this, they will be asked to complete some further questionnaires that will take approximately 10 minutes. Students will be asked to complete a questionnaire on demographics, general Facebook use activity, a measure of social anxiety, depression, and mood. A verbal debrief will be given at the end of the session.

**What if a pupil or the pupil’s parent wishes for their child not to take part?**

Parents will receive information on the study via an opt out letter that would be sent out to parents prior to the research session booked so that they can opt out of the research study on their child’s behalf. Students will also receive information about the study presented on the computers at the start of the session, and individual student consent will be obtained at this point before participating in the session.

**Is the data confidential?**

All responses will be anonymous and students will not be identifiable. No individual pupil’s scores will be released to the students, parent or school.

**Who can I contact about the study?**

If you would like to discuss any aspect of the research, you can contact me by email [Debbie.jagger.2015@rhul.ac.uk](mailto:Debbie.jagger.2015@rhul.ac.uk) or by phone on 01784 414012. You can also contact Dr Watling by email [Dawn.Watling@rhul.ac.uk](mailto:Dawn.Watling@rhul.ac.uk) or by phone at the above number.

We hope that your school will get involved in this important and exciting project, which will inform research on the effects of social media (Facebook) on mood in adolescents.

Kind regards,

Debbie Jagger

**6.2 Appendix B: Information and opt out letter for parents or guardians**



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Dear Parent/Guardian

My name is Debbie Jagger and I am a Trainee Clinical Psychologist studying for a Doctorate of Clinical Psychology at Royal Holloway, University of London. I am carrying out research for my Doctoral thesis under the supervision of Dr Dawn Watling. The current project is set to investigate how adolescents use Facebook and whether this is influenced by the way they think and feel in different social situations. I have arranged to visit …………………. on …………., and would greatly appreciate the participation of your child in this valuable research project during this time.

This research involves approximately 30 minutes of your child’s time on one occasion. Your child will be asked to complete a number of questionnaires asking them questions about how they think and feel in social situations and about their general activity on Facebook. They will also be asked to take part in a short task in which they will be asked to use their Facebook account for approximately 10 minutes and then to answer questions about how they used it. I will not be asking to join them as a friend on Facebook and will not be recording any information on their Facebook account, or looking at their Facebook accounts. It is important that all of the responses are anonymous (in no place will they write their name) where your child will be identified only by a number, and his or her information will be used for research purposes only. It is important to stress that children’s individual responses are not the focus, but rather the focus is on the responses of the year group as a whole. Individual responses will only be seen by our research team (i.e., individuals conducting research related to this D. Clin Psych project). Note that the school will be provided with a summary of the research findings after the research is complete.

This study has been reviewed and approved by the Psychology Department internal ethical procedure at Royal Holloway, and ……………the Head Teacher, has also given permission for this study to be carried out at…………... I have had a recent criminal records checks (Disclosure and Barring Service), a copy of which will be left with reception at the school. Children invited to take part in the study will be allowed to withdraw from a session at any time if they do not wish to continue.

This project is supervised by Dr Dawn Watling. If you would like to discuss any aspect of the research, you can contact me by email [Debbie.jagger.2015@rhul.ac.uk](mailto:Debbie.jagger.2015@rhul.ac.uk) or by phone on 01784 414012. You can also contact Dr Watling by email [Dawn.Watling@rhul.ac.uk](mailto:Dawn.Watling@rhul.ac.uk) or by phone at the above number.

If you do NOT wish for your child to take part, please complete and detach the information below, and return it to your child’s class teacher before …………..2018. Please retain the top portion of this letter for information on our study and our contact details. Your child’s right to privacy and confidentiality will be respected at all times. Note that you may withdraw your son or daughter from the study at any point during the schedule of research. Importantly, as noted above, if your son or daughter indicates that he or she does not want to take part in the session, at any point before or during the session their wishes will be respected.

Yours faithfully,

Debbie Jagger

✂\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

I wish for my son/daughter to be excluded from taking part in the research project being conducted by Debbie Jagger.

Signature of parent / guardian

Name of parent/guardian (please print)

Name of child

Name of class teacher

Date

**6.3 Appendix C: Student information and consent form on Qualtrics**



Dear Student,

We are conducting research into how young people use Facebook and would be extremely grateful if you could take some time to fill in the attached questionnaires and then take part in a short task which will involve using your Facebook account for a short period of time. This should only take about 25-30 minutes to do.  Your participation will further our understanding about how young people’s thoughts and feelings may influence the way they use Facebook and how Facebook affects our mood.

For this research we ask that you complete the questionnaires online. You should not put your name anywhere, as all of your individual responses will be confidential and we will not be discussing your responses with your parents or teachers. Some of these questionnaires will be of a personal nature and will assess mood. If you feel at any point that you do not want to answer a question, you may skip the question or questions. Also, if you feel at any point that you want to stop or to withdraw from our research study you may do so at any time.

Please let us know if you have any questions.

If you are happy to participate please complete the consent form.  If you have any questions please let us know. You can also contact us after today if you have any questions or would like feedback on the results of the study when it is completed using the email addresses below.

Thank you in advance for your invaluable contribution to my research.

Debbie Jagger                                                 Dr. Dawn Watling

Trainee Clinical Psychologist                          Senior Lecturer

debbie.jagger.2015@live.rhul.ac.uk                 Dawn.Watling@rhul.ac.uk

 You have been asked to participate in a study examining how individuals use Facebook, which is being carried out by Debbie Jagger, under the supervision of Dr Dawn Watling, Royal Holloway, University of London.

|  |  |
| --- | --- |
| *Have you (please tick):* |  |
| Read the information sheet about the study? | yes     no |
| Had an opportunity to ask questions? | yes     no |
| Got satisfactory answers to your questions? | yes     no |
| Understood that you’re free to withdraw from the study at any time, without giving a reason and without it affecting your education? | yes     no |
| **Do you agree to take part in the study?** | yes     no |

**6.4 Appendix D: Ethics approval form**

Ethics Application System <ethics@rhul.ac.uk>



Reply all|

Thu 10/5/2017, 11:16 AM

Jagger, Debbie (2015);

Watling, Dawn;

ethics@rhul.ac.uk

You forwarded this message on 1/11/2018 10:03 AM

PI: Dr Dawn Watling   
Project title: Passive and active use of Facebook: Impact on mood depending on level of Social Anxiety  
  
REC ProjectID: 393  
  
Your application has been approved by the Research Ethics Committee.  
Please report any subsequent changes that affect the ethics of the project to the University Research Ethics Committee ethics@rhul.ac.uk

**6.5 Appendix E: SIAS**

**Social Interaction Anxiety Scale**

**Instructions**

In this section, for each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true for you. *The rating scale is as follows:*

0 = **Not at all** characteristic or true of me.

1 = **Slightly** characteristic or true of me.

2 = **Moderately** characteristic or true of me.

3 = **Very** characteristic or true of me.

4 = **Extremel**y characteristic or true of me

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Characteristic** | **Not at all** | **Slightly** | **Moderately** | **Very** | **Extremely** |
| 01. | I get nervous if I have to speak with someone in authority (teacher, boss). | 0 | 1 | 2 | 3 | 4 |
| 02. | I have difficulty making eye contact with others. | 0 | 1 | 2 | 3 | 4 |
| 03. | I become tense if I have to talk about myself or my feelings. | 0 | 1 | 2 | 3 | 4 |
| 04. | I find it difficult to mix comfortably with the people I work with. | 0 | 1 | 2 | 3 | 4 |
| 05. | I find it easy to make friends my own age. | 0 | 1 | 2 | 3 | 4 |
| 06. | I tense up if I meet an acquaintance in the street. | 0 | 1 | 2 | 3 | 4 |
| 07. | When mixing socially, I am uncomfortable. | 0 | 1 | 2 | 3 | 4 |
| 08. | I feel tense when I am alone with just one person. | 0 | 1 | 2 | 3 | 4 |
| 09. | I am at ease meeting people at parties, etc. | 0 | 1 | 2 | 3 | 4 |
| 10. | I have difficulty talking with other people. | 0 | 1 | 2 | 3 | 4 |
| 11. | I find it easy to think of things to talk about. | 0 | 1 | 2 | 3 | 4 |
| 12. | I worry about expressing myself in case I appear awkward. | 0 | 1 | 2 | 3 | 4 |
| 13. | I find it difficult to disagree with another’s point of view. | 0 | 1 | 2 | 3 | 4 |

(continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ***Characteristic*** | ***Not at all*** | ***Slightly*** | ***Moderately*** | ***Very*** | ***Extremely*** |
| 14. | I have difficulty talking to attractive persons of the opposite sex. | 0 | 1 | 2 | 3 | 4 |
| 15. | I find myself worrying that I won’t know what to say in social situations. | 0 | 1 | 2 | 3 | 4 |
| 16. | I am nervous mixing with people I don’t know well. | 0 | 1 | 2 | 3 | 4 |
| 17. | I feel I’ll say something embarrassing when talking. | 0 | 1 | 2 | 3 | 4 |
| 18. | When mixing in a group, I find myself worrying I will be ignored. | 0 | 1 | 2 | 3 | 4 |
| 19. | I am tense mixing in a group. | 0 | 1 | 2 | 3 | 4 |
| 20. | I am unsure whether to greet someone I know only slightly. | 0 | 1 | 2 | 3 | 4 |

**6.6 Appendix F: The Positive and Negative Affect Scale**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you feel this way right now, that is, at the present moment.

Use the following scale for your answers.

Very Slightly

or Not at All            A Little Bit        Moderately        Quite a Bit            Extremely

          1                             2                        3                         4                         5

1.     Interested

2.     Distressed

3.     Excited

4.     Upset

5.     Strong

6.     Guilty

7.     Scared

8.     Hostile

9.     Enthusiastic

10.  Proud

11.  Irritable

12.  Alert

13.  Ashamed

14.  Inspired

15.  Nervous

16.  Determined

17.  Attentive

18.  Jittery

19.  Active

20.  Afraid

**6.7 Appendix G: Center for Epidemiological Studies – Depression Scale**

**For each statement, please circle the number in the column that best describes how you have been feeling *in the past week.***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Rarely or none of the time (less than 1 day) | | Some or a little of the time (1- 2days) | | Occasionally or a moderate amount of the time (3-4 days) | | Most or all of the time (5-7 days) | |
| 1. | I was bothered by things that usually don’t bother me. | 0 | | 1 | | 2 | | 3 | |
| 2. | I did not feel like eating; my appetite was poor. | 0 | | 1 | | 2 | | 3 | |
| 3. | I felt that I could not shake off the blues, even with the help from family or friends. | 0 | | 1 | | 2 | | 3 | |
| 4. | I felt that I was just as good as other people. | 3 | | 2 | | 1 | | 0 | |
| 5. | I had trouble keeping my mind on what I was doing. | 0 | | 1 | | 2 | | 3 | |
| 6. | I felt depressed. | 0 | | 1 | | 2 | | 3 | |
| 7. | I felt that everything I did was an effort. | 0 | | 1 | | 2 | | 3 | |
| 8. | I felt hopeful about the future. | 3 | | 2 | | 1 | | 0 | |
| 9. | I thought my life had been a failure. | 0 | | 1 | | 2 | | 3 | |
| 10. | I felt fearful. | 0 | | 1 | | 2 | | 3 | |
| 11. | My sleep was restless. | 0 | | 1 | | 2 | | 3 | |
| 12. | I was happy. | 3 | | 2 | | 1 | | 0 | |
| 13. | I talked less than usual. | 0 | | 1 | | 2 | | 3 | |
| 14. | I felt lonely. | | 0 | | 1 | | 2 | | 3 | |
| 15. | People were unfriendly. | | 0 | | 1 | | 2 | | 3 | |
| 16. | I enjoyed life. | | 3 | | 2 | | 1 | | 0 | |
| 17. | I had crying spells. | | 0 | | 1 | | 2 | | 3 | |
| 18. | I felt sad. | | 0 | | 1 | | 2 | | 3 | |
| 19. | I felt that people dislike me. | | 0 | | 1 | | 2 | | 3 | |
| 20. | I could not get “going”. | | 0 | | 1 | | 2 | | 3 | |

**6.8 Appendix H: Active and passive Facebook use scale (adapted from Frison and Eggermont’s (2015b) 10-item Multidimensional Scale of Facebook use)**

**Below is a list of the ways you might use Facebook.**

**Please indicate how often you use each of the Facebook functions.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Never | Less than once a month | Monthly | Weekly | More than once a week but not everyday | Daily | Several times a day |

1.How often do you send

someone a personal

message on Facebook?

2.How often do you chat

online with someone on

Facebook?

3.How often do you post

a message/update your

status on your timeline?

4.How often do you post

a photo on your timeline?

5.How often do you post

something else on your

timeline (e.g. a video)?

6.How often do you browse

your newsfeed?

7.How often do you browse

a profile of a Facebook

friend?

8.How often do you browse

a profile of a non-Facebook

friend?

9.How often do you look at

photos of a Facebook

friend?

10.How often do you look at

photos of a non-Facebook

friend?

11.How often do you ‘share’

someone else’s post or

video?

12.How often do you 'like' or

comment on someone else's

post?

**6.9 Appendix I: Debrief**



Thank you for participating in our research study. Remember that all of your answers are private and we do not have your name recorded with your answers. We will not be showing your individual answers to anybody outside our research team.

Facebook is one of the most popular social media sites used by young people, and past research has shown that people vary in how they use Facebook. We are really interested in whether our feelings about interacting with others (for instance, do we feel relaxed when meeting new people or do we get anxious when meeting new people) can influence how we use Facebook. Here we are looking at the relationship between our feelings in social situations and the way that we use Facebook. We were trying to understand how different ways that we use Facebook could influence our mood.

We asked quite a few questions about how you feel about yourself, and how you think and feel in different social situations. We also had you use your Facebook account for a period of time, and asked about your mood before and after the task. This, alongside understanding what features of Facebook that you usually use, and your responses to the questionnaires will allow us to understand how the way we think and feel in social situations, may influence the way we use Facebook, and how Facebook affects our mood.

We expect that individuals who feel more uncomfortable in social situations will use Facebook differently than individuals who feel more comfortable in social situations.

 If you have any questions that you would like to ask me about our project, please let me know.

**Thank you again for helping us with our research.**

Importantly, if you feel you have personal issues or problems then help is available through contacting your GP who should be able to help in directing you to the appropriate counselling, or you could contact the Samaritans on 116 123, Childline, or speak to your school counsellor.

**6.10 Appendix J: Demographic questionnaire**

**Before you start we just need to know a little bit about you.**

**Are you a boy or a girl?**

Boy

Girl

Other or prefer not to say

**What is your age?**

**What is your ethnicity?**

White British

White other

Black British

Black African

Black Caribbean

Indian

Pakistani

Asian

**6.11 Appendix K: Facebook task instructions for Active condition**

We would now like you to follow the following instructions. Please read these instructions carefully and then click on the Facebook image to go to your Facebook account. Facebook will open in a new window.

**Do NOT close this window as you will come back to it.**

**INSTRUCTIONS:**  
  
In Facebook, please log into your account. Note that we will not be viewing your account, or recording any information from this. We are interested in how using Facebook in different ways may affect how you think and feel. For this reason, we are providing different instructions to you and your peers.  
  
**We would like you to spend the next 10 minutes using Facebook for direct communication:** for example, posting status updates, commenting on posts, sharing or liking others' posts, updating your profile page or sending messages. It is your choice which features you choose to use. 

We do ask that you only use Facebook for direct communication and refrain from other activities such as browsing your newsfeed, or looking at friends' pages.    
  
Please ask if you have any questions. If you do not have any questions, please click on the Facebook link below. Remember, do not close this window as you will come back to it.  
  
[](http://facebook.com/)

**6.12 Appendix L: Facebook task instructions for Passive newsfeed browsing condition**

**Do NOT close this window as you will come back to it.**

**INSTRUCTIONS:**  
  
In Facebook, please log into your account. Note that we will not be viewing your account, or recording any information from this. We are interested in how using Facebook in different ways may affect how you think and feel. For this reason, we are providing different instructions to you and your peers.  
  
**We would like you to spend the next 10 minutes browsing through your own newsfeed.** Do not 'react' to or share any posts, or post any status updates. We wish for you to simply scroll through and read the posts that are viewable on your newsfeed.  
  
Please ask if you have any questions. If you do not have any questions, please click on the Facebook link below. Remember, do not close this window as you will come back to it.

[](http://facebook.com/)

**6.13 Appendix M: Facebook task instructions for Passive social searching condition**

We would now like you to follow the following instructions. Please read these instructions carefully and then click on the Facebook image to go to your Facebook account. Facebook will open in a new window.

**Do NOT close this window as you will come back to it.**

**INSTRUCTIONS:**  
  
In Facebook, please log into your account. Note that we will not be viewing your account, or recording any information from this. We are interested in how using Facebook in different ways may affect how you think and feel. For this reason, we are providing different instructions to you and your peers.  
  
**We would like you to spend the next 10 minutes browsing through your friend’s newsfeed.** Do not 'react' to or share any posts, or post any status updates. We wish for you to simply go to a friend's newsfeed and scroll through and read the posts that are viewable on his or her newsfeed.  
  
Please ask if you have any questions. If you do not have any questions, please click on the Facebook link below. Remember, do not close this window as you will come back to it.

[](http://facebook.com/)

**6.14 Appendix N : Facebook features used**

**Please tick all of the Facebook features that you have just used from those listed below.**

Posted a status update

Updated my profile (i.e. profile picture, information on my profile)

Commented on someone's post

Liked someone's post

Reacted to someone's post

Shared someone's post

Sent a private message on messenger

Browsed my newsfeed

Browsed content and posts on friends' timelines

**6.15 Appendix O: Facebook content viewed**

**Please indicate what percentage of the following items make up the newsfeed you have just viewed:**

Funny memes %

Content that is upsetting %

Content that is entertaining %

Friends posts %

News posts %

Advertisements %

Other %

**If other, please type in what additional newsfeed items you viewed below:**

………………………………………………………………

**6.16 Appendix P: Motivations for using SNS**

*Figure 3.5*. Most commonly reported motivation for using Facebook in low and high social anxiety groups.

**6.17 Appendix Q: Missing data for variables in the analyses**

Table 6.1

*Missing data in the analysis for Hypothesis 1*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ***Cases*** | | | | | |
|  |  | ***Valid*** | | ***Missing*** | | ***Total*** | |
| ***Type of FB use*** | ***SA group*** | ***N*** | ***%*** | ***N*** | ***%*** | ***N*** | ***%*** |
| Active FB mean | Low  High | 50 | 89.3 | 6 | 10.7 | 56 | 100 |
| 39 | 92.9 | 3 | 7.1 | 42 | 100 |
| Passive FB mean | Low  High | 50 | 89.3 | 6 | 10.7 | 56 | 100 |
| 39 | 92.9 | 3 | 7.1 | 42 | 100 |

Table 6.2

*Missing data in the analysis for Hypothesis 2, 3, and 4*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | ***Cases*** | | | | | |
| ***Positive mood*** | | | ***Valid*** | | ***Missing*** | | ***Total*** | |
| ***Time*** | ***Facebook group*** | ***SA group*** | ***N*** | ***%*** | ***N*** | ***%*** | ***N*** | ***%*** |
| Time 1 | Active | Low | 17 | 94.4 | 1 | 5.6 | 18 | 100 |
| Time 2 | Active | Low | 17 | 94.4 | 1 | 5.6 | 18 | 100 |
| Time 1 | Passive newsfeed browsing | Low | 18 | 90 | 2 | 10 | 20 | 100 |
| Time 2 | Passive newsfeed browsing | Low | 18 | 90 | 2 | 10 | 20 | 100 |
| Time 1 | Passive social searching | Low | 14 | 100 | 0 | 0 | 14 | 100 |
| Time 2 | Passive social searching | Low | 14 | 100 | 0 | 0 | 14 | 100 |
| Time 1 | Active | High | 14 | 93.3 | 1 | 6.7 | 15 | 100 |
| Time 2 | Active | High | 14 | 93.3 | 1 | 6.7 | 15 | 100 |
| Time 1 | Passive newsfeed browsing | High | 15 | 100 | 0 | 0 | 15 | 100 |
| Time 2 | Passive newsfeed browsing | High | 15 | 100 | 0 | 0 | 15 | 100 |
| Time 1 | Passive social searching | High | 11 | 100 | 0 | 0 | 11 | 100 |
| Time 2 | Passive social searching | High | 11 | 100 | 0 | 0 | 11 | 100 |

*(continued)*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | ***Cases*** | | | | | |
| ***Negative mood*** | | | ***Valid*** | | ***Missing*** | | ***Total*** | |
| ***Time*** | ***FB group*** | ***SA group*** | ***N*** | ***%*** | ***N*** | ***%*** | ***N*** | ***%*** |
| Time 1 | Active | Low | 17 | 94.4 | 1 | 5.6 | 18 | 100 |
| Time 2 | Active | Low | 17 | 94.4 | 1 | 5.6 | 18 | 100 |
| Time 1 | Passive newsfeed browsing | Low | 18 | 90 | 2 | 10 | 20 | 100 |
| Time 2 | Passive newsfeed browsing | Low | 18 | 90 | 2 | 10 | 20 | 100 |
| Time 1 | Passive social searching | Low | 14 | 100 | 0 | 0 | 14 | 100 |
| Time 2 | Passive social searching | Low | 14 | 100 | 0 | 0 | 14 | 100 |
| Time 1 | Active | High | 14 | 93.3 | 1 | 6.7 | 15 | 100 |
| Time 2 | Active | High | 14 | 93.3 | 1 | 6.7 | 15 | 100 |
| Time 1 | Passive newsfeed browsing | High | 15 | 100 | 0 | 0 | 15 | 100 |
| Time 2 | Passive newsfeed browsing | High | 15 | 100 | 0 | 0 | 15 | 100 |
| Time 1 | Passive social searching | High | 11 | 100 | 0 | 0 | 11 | 100 |
| Time 2 | Passive social searching | High | 11 | 100 | 0 | 0 | 11 | 100 |

**6.18 Appendix R: Frequency of Facebook use**

*Figure 3.2*. Frequency of Facebook use for low and high social anxiety groups.

**6.19 Appendix S: Time spent on Facebook at each login**

*Figure 3.3*. Time spent on Facebook for low and high social anxiety groups.

1. The time lapse between searches was due to a period of maternity leave [↑](#footnote-ref-1)
2. To address normality and outliers, negative mood variables were transformed using inverse transformations. This corrected for normality on all except high SA, in active use, at time 1 (p = .20), and passive social searching at both time points (p = .15 and p = .20). No outliers were identified. However, findings remained the same as with untransformed data therefore the original data was used as it was considered more informative. [↑](#footnote-ref-2)
3. Five outliers were removed from negative mood variables (time 1 and time 2) which removed 6 participants’ data. However, assumptions of normality remained violated with two outliers, therefore original data was used in the analysis. [↑](#footnote-ref-3)