**Social Anxiety and Facebook Use: Exploring Predictors of Comfort Interacting on Facebook and Face-to-Face in People with High and Low Levels of Social Anxiety**

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**Table of Contents**

**Executive Summary** ……………………..……………………………………..……5

**Systematic Review** ...……..…………….…………………………………………...13

Abstract …………………………………………………………………...……...13

Introduction ………………………………………………………………………15

Method …………………………………………………………………………...24

Results ……………………………………………………………………………26

*Figure 1. PRISMA diagram* …………………………………………………..28

*Table 1. Characteristics of included studies* ………….………………………29

*Table 2. Quality assessment of included studies* ……………………………...40

Discussion ………………………………………………………………………..46

**Empirical Study** …………………………………………………………………….61

Abstract …………………………………………………………………………..61

Introduction …………………………………………………………………...….63

Method ……………………………………………………………...………...….70

*Table 3. Participant characteristics* ………………………………..………....71

Results …………………………………………………………...……………….79

*Table 4. Descriptive statistics for each variable* ………………..…………….80

*Table 5. Summary of main regression analysis* ……………………………….83

*Table 6. Multiple regression zero-order correlations table* …………...……...89

*Table 7. Qualitative data* ……………………………………………………...94

Discussion ………………………………………………………………………..95

**Integration, Impact and Dissemination Summary** ……………………..…..…...106

Integration ……………………………………………………………………....106

Impact …………………………………………………………………………...110

Dissemination ………………………………………………………………...…117

**References** ……...…………………………………………………….………...….120

**Appendices** ……………………………………………………………...…………139

Appendix A: Methodological quality assessment tool ..………………………...140

Appendix B: Ethical approval form …………………………………...………..143

Appendix C: Preference for Facebook Interaction Scale ...……………………..144

Appendix D: Factor analysis - Self-Presentation on Facebook Questionnaire ....145

Appendix E: Information and consent form …………………………...………..146

Appendix F: Summary of research distributed to participants ...…………….….150

Appendix G: Qualitative analysis, thematic map and participant quotes ...…….152

**Executive Summary**

**Introduction**

Social anxiety (SA) is a fairly common human experience which involves fear of negative evaluation from others and feelings of anxiety around social or performance situations (American Psychiatric Association, 2013; Morrison & Heimberg, 2013). In recent years, social interactions have increasingly begun to take place online (Eraslan-Capan, 2015). The aim of this thesis was to explore the relationships between feelings of SA and use of Facebook, a popular social networking website. The systematic review focussed on exploring the potential benefits and disadvantages of using Facebook for people with SA, whilst the empirical study explored predictors of comfort interacting on Facebook and face-to-face in these individuals.

**Systematic Review**

Because of their concern about negative evaluation from others, individuals with SA tend to either avoid social situations or else tolerate them with intense feelings of anxiety (American Psychiatric Association, 2013). For this reason, it has been suggested that online interactions may provide an alternative method of communicating with others for those with SA, since there are certain aspects of interacting online which may reduce feelings of anxiety (Green, Wilhelmsen, Wilmots, Dodd, & Quinn, 2016). In recent years, day-to-day social interactions have increasingly begun to take place on online social networking sites (Baker & Jeske, 2015). Whilst there are likely to be some benefits of communicating on social networking sites for individuals with SA, there are also likely to be disadvantages. The aim of this systematic review was to gather and review the evidence on the potential benefits and disadvantages of using Facebook for individuals with SA.

Studies were identified through a systematic online search of PsycINFO, PubMed and Web of Science databases, using terms related to SA and Facebook. After removing duplicate articles, the titles and abstracts of 94 studies were screened. This identified eleven studies which met criteria for inclusion in the review.

In terms of the potential benefits of using Facebook for individuals with SA, the included studies identified that people with SA can use Facebook to fulfil their social needs and seek social support and that they value particular aspects of Facebook communication, which may be associated with reduced feelings of anxiety. One study suggested associations between receiving social support on Facebook and wellbeing. Furthermore, some research suggested individuals with SA feel better able to self-disclose information about themselves on Facebook, which is thought to contribute to developing and maintaining social relationships.

The studies included in the systematic review also identified some disadvantages of Facebook use for those with SA. Three studies suggested an association between SA and problematic Facebook use, for example spending prolonged time on Facebook and finding it difficult to control Facebook use, which may be associated with negative social, academic and professional consequences. One study suggested that exposure to someone on Facebook was associated with increased arousal during a subsequent face-to-face encounter for those with SA, perhaps suggesting the increased experience of negative emotions. The results also suggested that people with SA continue to experience feelings of anxiety when using Facebook. Furthermore, the current review identified an association between SA and increased passive Facebook use, which may be associated with negative outcomes, such as reduced feelings of bonding with others and increased loneliness.

The findings of this review may have implications for the treatment of people with SA. Since Facebook use is widespread in society, clinicians working with people with SA may wish to consider the potential benefits and disadvantages of Facebook use in their work with these individuals. Clinicians may also consider including Facebook interactions in the development of fear hierarchies and exposure exercises (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004), since individuals with SA may find it easier to carry out these exercises online. However, clinicians should also consider that online interactions may serve as a form of safety behaviour through which individuals with SA can avoid threatening face-to-face interactions, which may then lead to problematic internet use (Lee & Stapinski, 2012).

In spite of these implications, it should be noted that there were some limitations to the systematic review which may affect the conclusions that can be drawn. The majority of research included in the review was cross-sectional, therefore the direction of causality between SA and the potential benefits and disadvantages of Facebook use cannot be determined. The research was also generally rated as weak in terms of methodological quality. This was due to poor control for selection bias or confounders and the fact that a number of studies developed a completely new measure for their study and did not report on the validity of this. Therefore, further strong quality, longitudinal research is required before firm conclusions can be drawn about the potential benefits and disadvantages of Facebook use for people with SA.

**Empirical Study**

Previous research has suggested that people with SA report feeling more comfortable when interacting online compared to face-to-face. However, limited research has explored feelings of comfort on social networking sites for those with SA and the factors that may contribute to this (Prizant-Passal, Shechner, & Aderka, 2016). The aim of this research was to explore whether the core features of SA suggested by the cognitive-behavioural model (negative cognitions, safety behaviours and impression management) were associated with feelings of comfort interacting on Facebook and face-to-face. These associations were explored in both individuals with high and low levels of SA. The research also included a qualitative element to further explore the factors that contribute to comfort on Facebook and face-to-face.

Two hundred and forty-four potential participants were screened online for feelings of SA. Of these, 149 were excluded either because they did not meet the criteria for high or low SA, they reported suicidality, were currently being treated for a mental health difficulty or had substantial missing data. This left a total sample of 94 participants, 43 with high SA and 51 with low SA. Participants completed a number of online questionnaire measures exploring negative cognitions, safety behaviours and impression management both on Facebook and face-to-face, as well as feelings of comfort on Facebook and the factors which participants thought contributed to their feelings of comfort on Facebook and face-to-face.

A hierarchical multiple regression analysis suggested that SA was associated with comfort interacting on Facebook. Compared to those with low SA, individuals with high SA reported reduced feelings of comfort face-to-face and increased feelings of comfort on Facebook. However, this association became non-significant when safety behaviours, negative cognitions and impression management were considered. Furthermore, the scores of high SA participants were within the range suggesting that they still felt more comfortable communicating face-to-face rather than on Facebook.

These findings contrast with previous research which has suggested that people with high SA feel more comfortable online compared to face-to-face. This may be due to differences between Facebook and other online environments, which mean that those with SA feel less comfortable on Facebook than in other online settings. Alternatively, this may be because the majority of previous research did not control for potential confounding variables. The current research suggests that thoughts, behaviours and impression management may also be important in explaining feelings of comfort on Facebook.

Indeed, the combination of safety behaviours, negative cognitions and impression management along with SA explained a large amount of the variance in comfort interacting on Facebook. False-self presentation face-to-face was significantly positively associated with comfort on Facebook. There was also a trend for real-self presentation face-to-face to be negatively associated with comfort on Facebook. Negative cognitions and safety behaviours were not independently significantly associated with comfort on Facebook. There were no significant differences between the high and low SA groups.

A thematic analysis was used to explore the factors that participants thought contributed to their levels of comfort on Facebook. Participants identified being able to plan what to say and being able to avoid being seen, awkwardness or making mistakes. The results also suggested that participants with low SA valued being able to maintain and widen their social networks on Facebook, but this was not the case for those with high SA. Furthermore, participants with high SA were concerned about the lack of privacy on Facebook, and this contributed to some participants with high SA feeling more comfortable face-to-face.

These findings may have implications for the treatment of SA. Since social interactions are increasingly taking place on social media, clinicians may wish to consider the role of negative cognitions, safety behaviours and impression management in maintaining SA during online interactions. However, this research has a number of limitations which limit the conclusions that can be drawn. The design was cross-sectional; thus causality cannot be determined. The sample was comprised of students and the Facebook connections of the researcher, and was therefore unrepresentative of the broader demographic of Facebook users. There were also some concerns about the validity and reliability of some of the measures used. Further, longitudinal research is required before firm conclusions can be drawn about the factors that contribute to feelings of comfort on Facebook for those with SA.

**Integration, Impact and Dissemination**

This thesis explored the relationships between feelings of SA and Facebook use. The systematic review explored the benefits and disadvantages of Facebook use for people with SA and the empirical study explored the factors that contribute to feelings of comfort on Facebook for those with SA. There was broad overlap in terms of some of the themes explored and the empirical study to some extent built on the topics explored in the systematic review. For example, it further explored some of the potential benefits and disadvantages of Facebook use for people with SA, such as feelings of comfort. This thesis topic seemed to integrate well with recent media coverage of the disadvantages of Facebook use and changing attitudes towards Facebook within society.

In terms of the impact of this thesis, I noticed an impact on myself both personally and professionally in my practice as a clinician and researcher. Completing this research encouraged me to consider my own Facebook use and the use of social media in my work with clients. There was also an impact of completing the research on some study participants, in that it made them think more about their own and other people’s social media use. This thesis may also have broader clinical and research impacts, in terms of encouraging clinicians to consider Facebook use in their work with individuals with SA and identifying areas where future research is required. Longitudinal research and research with individuals diagnosed with social anxiety disorder (SAD) is needed, as well as research exploring the potential benefits and disadvantages of online interactions more generally for those with SA. This could contribute to discussions around the benefits and disadvantages of delivering CBT for SAD via the internet.

The results of the research were disseminated to participants and to clinical psychology trainees at Royal Holloway. Their feedback was useful in allowing me to gain new insights into how to interpret the findings and considering potential areas for future research. I intend to submit this research for publication in Computers in Human Behaviour, and to write a piece for Clinical Psychology Forum in order to more widely disseminate the findings. Since Facebook use is so widespread in society it is important that clinicians are aware of the significant relationships between SA and Facebook use.

**Systematic Review**

**Evaluating the Potential Benefits and Disadvantages of Facebook Use for People with Social Anxiety: A Systematic Review.**

Abstract

Online social networking sites provide an alternative method of communicating with others for individuals with social anxiety (SA). However, there are likely to be both benefits and disadvantages of using these sites for people with SA. The aim of this systematic review was to gather and review the evidence on the potential benefits and disadvantages of the social networking site Facebook for individuals with SA. A systematic literature search of databases and reference lists identified eleven studies which met inclusion criteria. These studies suggested that individuals with SA use Facebook to fulfil their social needs and seek social support. Individuals with SA also appear to value particular aspects of Facebook communication, which may be associated with reduced feelings of anxiety. Some research also suggested individuals with SA feel better able to self-disclose on Facebook, particularly in private modes of communication. The potential disadvantages of Facebook use for people with SA included increased problematic Facebook use, increased arousal during subsequent face-to-face encounters, increased passive Facebook use and increased feelings of anxiety on Facebook. Since Facebook use is widespread in society, clinicians working with people with SA may wish to consider the potential benefits and disadvantages of Facebook use for these individuals. However, the majority of research included in this review was cross-sectional and had generally weak methodological quality. Therefore, further strong quality, longitudinal research exploring the potential benefits and disadvantages of Facebook use for people with SA is required.

**Introduction**

Social anxiety (SA), or the fear of negative evaluation from others in social situations, is a fairly common human experience (Morrison & Heimberg, 2013). Experiences of SA are thought to exist on a continuum, ranging from the complete absence of social fear through ordinary shyness and mild levels of SA, to more intense and functionally impairing SA, which may be diagnosed as social anxiety disorder (SAD; Kashdan, 2007; Morrison & Heimberg, 2013). Individuals with SAD experience intense fear and anxiety around social or performance situations and worry that in such situations they may do or say something to embarrass themselves (American Psychiatric Association, 2013). The estimated lifetime prevalence of SAD is 12.1% (Ruscio et al., 2008); however, it is thought that approximately 10% of people have subthreshold symptoms of SA, which are not severe enough to meet the criteria for diagnosis (Fehm, Pelissolo, Furmark, & Wittchen, 2005).

Because individuals with high levels of SA experience significant anxiety and fear in social situations, these situations tend to either be avoided or else endured with intense distress (American Psychiatric Association, 2013). This means that individuals with SA have fewer opportunities to build relationships with others, thus tend to have fewer social relationships and less social support than those with lower levels of SA (Kashdan, 2007; Ledley et al., 2008; Stein & Kean, 2000). However, in recent years, online communication has become an increasingly popular way for people to stay connected with friends, and it has been suggested that communicating online may provide an alternative method of building social relationships and communicating with others for those who experience SA (Green, Wilhelmsen, Wilmots, Dodd, & Quinn, 2016). It is thought that certain aspects of the online environment may allow socially anxious individuals to overcome the anxiety and distress that they experience in face-to-face situations, thus perhaps allowing them to develop more extensive social networks online (Indian & Grieve, 2014; Valkenburg, Schouten, & Peter, 2005; Zywica & Danowski, 2008). For example, unlike face-to-face interactions, online communication allows the possibility of complete anonymity, and physical appearance and visual cues are not present during the conversation. This means that the individual does not have to pay attention to cues such as eye-contact and facial expressions, which can increase feelings of anxiety (Green et al., 2016; McKenna & Bargh, 2000; Peter & Valkenburg, 2006). In addition, in online settings the user has more time to think about and edit what they want to say and how they want to say it (Green et al., 2016; McKenna & Bargh, 2000; Valkenburg et al., 2005; Zywica & Danowski, 2008). This allows greater control over self-presentation, which may be valued by individuals with SA as they might perceive less risk of making a negative impression on others in online compared to face-to-face environments (Caplan, 2007).

Indeed, research suggests that individuals with SA do prefer communicating online, because they feel more comfortable and less anxious, and find online communication easier than face-to-face (Caplan, 2007; Erwin, Turk, Heimberg, Fresco, & Hantula, 2004; Lee & Stapinski, 2012; Martončik & Lokša, 2016; Murphy & Tasker, 2011; Pierce, 2009; Prizant-Passal, Shechner, & Aderka, 2016; Shepherd & Edelmann, 2005; Weidman et al., 2012; Yen et al., 2012). Individuals with higher levels of SA also tend to report valuing the aspects of online communication that have been hypothesised to reduce their feelings of anxiety, for example the ability to just listen rather than talk, having more time to think about what they want to say and how to say it, other people not being able to see visible signs of their anxiety, and being able to hide their identity (Erwin et al., 2004; Lee & Stapinski, 2012; Peter & Valkenburg, 2006; Shepherd & Edelmann, 2005; Young & Lo, 2012). Thus it appears that particular aspects of the online environment may contribute to individuals with SA feeling less anxious and finding it easier to communicate online.

It has been suggested that as well as contributing to greater feelings of comfort online, the reduction in visual cues and increased controllability in online environments may encourage greater self-disclosure amongst those with SA (Green et al., 2016). Revealing personal and intimate information about oneself is an important part of building and maintaining social relationships (Buhrmester & Furman, 1987; Green et al., 2016). However, research has suggested that individuals with high SA disclose less intimate information about themselves during face-to-face interactions than non-anxious individuals (Meleshko & Alden, 1993). This may contribute to difficulties in establishing and developing close interpersonal relationships (Ledley et al., 2008). However, compared to face-to-face settings, in online settings individuals with higher levels of SA report feeling less inhibited (Shepherd & Edelmann, 2005), and better able to talk about their feelings (Peter & Valkenburg, 2006) and express their real selves (McKenna, Green, & Gleason, 2002). Individuals with SA also report more frequent self-disclosure in online compared to face-to-face settings (Wang, Jackson, & Zhang, 2011; Weidman et al., 2012), which is thought to contribute to developing and maintaining social relationships (Green et al., 2016). In online settings, self-disclosure can take the form of sharing personal photos, which may feel less threatening for individuals with SA than direct face-to-face self-disclosure (Joinson, Reips, Buchanan, & Schofield, 2010; Scott, Boyle, Czerniawska, & Courtney, 2017). Research suggests that attributes of online communication, such as reduced cues and controllability and increased disinhibition are important mediators of the relationship between SA and self-disclosure (Green et al., 2016; Schouten, Valkenburg, & Peter, 2007). Thus it appears to be these novel aspects of the online environment which encourage self-disclosure for individuals with SA. However, one study showed that this was only the case in private, compared to public modes of online communication (Green et al., 2016). This suggests that it may only be more private forms of online communication that facilitate self-disclosure in individuals with SA.

It has also been suggested that online settings may be a valuable resource through which individuals can receive social support, particularly for those experiencing mental health difficulties (Dobrean & Păsărelu, 2016). Indeed, Indian & Grieve (2014) found that for individuals with high SA, social support received through social media was a significant predictor of well-being, whereas offline social support did not significantly predict well-being. This was not the case for individuals with low SA. It may be that for those with SA, social support received online is more effective at improving well-being than offline social support, which may be a benefit of communicating online for these individuals. However, it should be noted that this research was cross-sectional, therefore a causal link between online social support and improved well-being cannot be established.

In summary, it appears that individuals with SA value the reduction in visual cues, the opportunity for anonymity and the greater controllability of online environments. These factors appear to lead to certain benefits of online environments for individuals with SA, such as greater feelings of comfort, greater self-disclosure and more effective social support. Indeed, the potential benefits of online environments for people with high SA have led to suggestions that internet delivered therapy may be preferable and more acceptable than face-to-face therapy for the treatment of SAD (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Tillfors et al., 2008).

Whilst there do appear to be some potential benefits of online environments for individuals with SA, research also suggests that there may be disadvantages of communicating online for these individuals. It has been suggested that individuals with SA may use the internet as a way to avoid face-to-face interactions (Lee & Stapinski, 2012). Lee and Stapinski (2012) have suggested that because individuals with SA feel more comfortable online, they may have more success in their online compared to face-to-face interactions. However, this success may be attributed to factors related to the online environment, rather than personal attributes, thus further reducing the confidence of those with SA to interact in real life settings and leading to greater avoidance of face-to-face interactions (Lee & Stapinski, 2012; Prizant-Passal et al., 2016; Saunders & Chester, 2008). Indeed, Lee & Stapinski (2012) found that in individuals with high levels of SA, a preference for online interaction was associated with increased avoidance of real-life social situations. This perhaps supports the hypothesis that communicating online may increase avoidance of face-to-face interactions in individuals with SA.

It has been suggested that increased avoidance of face-to-face interactions and a move to communicating more frequently with others online may lead to problematic internet use (Lee & Stapinski, 2012). Problematic internet use refers to the experience of cognitive and behavioural symptoms related to using the internet, for example obsessional thoughts about the internet and the inability to cease use, along with associated negative social, academic and professional consequences (Davis, 2001; Caplan, 2007). Research in samples of both adults and adolescents has suggested that higher levels of SA are associated with problematic internet use (Aladwani & Almarzouq, 2016; Caplan, 2007; Cuhadar, 2012; Lee & Stapinski, 2012; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). Furthermore, a recent meta-analysis revealed a small but significant pooled effect size between SA and problematic internet use (Prizant-Passal et al., 2016). Caplan (2007) found that the link between SA and problematic internet use was mediated by preference for online social interaction, suggesting that those with SA who prefer communicating online may be more likely to develop problematic internet use. However, it should be noted that the majority of research conducted in this area has been cross-sectional, therefore it is difficult to determine the direction of causality between SA, social avoidance and problematic internet use.

Research also suggests that there may be other disadvantages of interacting online for individuals with SA. For example, Weidman et al. (2012) found that higher levels of SA were associated with lower ratings of quality of life and higher depression, and this relationship was strongest for those individuals who communicated frequently online. This suggests that for individuals with SA, communicating online may exacerbate the association between SA and depression and lower quality of life. However, again the cross-sectional design of this study precludes the identification of causal links between these variables. In a longitudinal study with adolescents, Selfhout, Branje, Delsing, ter Bogt and Meeus (2009) found that for those with low friendship quality, using the internet for non-communicative as opposed to communicative purposes predicted increased depression and SA one year later. It could be hypothesised that due to the negative impact of SA on social relationships, individuals with SA may be more likely to have lower friendship quality, and therefore may be more vulnerable to the detrimental effects of internet use on symptoms of depression and SA. However, this research did not specifically investigate these associations in individuals with SA, therefore the longitudinal impact of internet communication on wellbeing for individuals with high levels of SA cannot be determined.

In recent years there has been an increase in the popularity of online social networking sites, particularly due to the emergence of smartphones, which allow the constant accessibility and presence of social networking sites in user’s lives (Baker & Jeske, 2015; Bodroža & Jovanović, 2016). This has meant that social interactions are increasingly taking place on social networking sites (Baker & Jeske, 2015; Eraslan-Capan, 2015), which are considered to be at “*the forefront of online communication*” (Green et al., 2016, p. 208). Facebook is perhaps the largest and most popular social networking site, with an estimated 2.01 billion active monthly users worldwide (Facebook, 2018). Facebook allows users to communicate in a number of different ways, for example sharing status updates or photos with their friends, commenting on the walls, posts or photos of others, and instant messaging (große Deters, Mehl, & Eid, 2016; Lee-Won, Herzog, & Park, 2015; Moreau, Laconi, Delfour, & Chabrol, 2015). Facebook users can also choose whether they want to communicate in a public manner with a large audience or more privately with a small number of others (Green et al., 2016). Thus Facebook may potentially provide a platform which suits both those who are more extraverted and open as well as those who are more introverted and prefer to communicate more privately.

As with other forms of online communication, there are aspects of Facebook communication which may be preferred by individuals with SA, for example the reduced physical appearance and visual cues, and increased controllability and temporal flexibility of conversations (Green et al., 2016; Sheldon, 2008). Facebook is also a setting in which individuals can carefully construct the way they present themselves, in terms of the information they communicate through their profiles, comments, private messages and pictures (Burke & Ruppel, 2015). This may be particularly attractive to individuals with SA. It is possible that, as has been found in other online settings, these aspects of Facebook communication may benefit individuals with SA in terms of greater feelings of comfort and greater self-disclosure on Facebook compared to face-to-face.

However, Facebook communication differs from other forms of online communication in a number of ways. On Facebook, one cannot remain anonymous and communicative interactions tend to take place within the user’s network of established ‘friends’ (Rauch, Strobel, Bella, Odachowski, & Bloom, 2014; Sheldon, 2008). On Facebook it is also possible for users to behave more passively, for example viewing other people’s profiles without commenting, consuming news articles or broadcasting updates to large audiences (Burke, Kraut, & Marlow, 2011; Rauch et al., 2014; Shaw, Timpano, Tran, & Joorman, 2015). Those who primarily use Facebook in more passive ways may spend much time on the site but spend little of this time actually interacting directly with others (McCord, Rodebaugh, & Levinson, 2014), meaning they may receive little social benefit from using Facebook. Some research suggests that there may be negative outcomes to passive Facebook communication, for example reduced feelings of bonding with others and increased feelings of loneliness, compared to more direct forms of Facebook communication (Burke et al., 2011; Burke, Marlow, & Lento, 2010). Research suggests that individuals with high levels of SA are more likely to report passive Facebook use (Shaw et al., 2015), thus may be more vulnerable to the negative effects of passive Facebook communication. Therefore, it is possible that because of the differences between Facebook and other forms of online communication, socially anxious individuals may not benefit from Facebook interactions in the same way that they benefit from other forms of online communication (Rauch et al., 2014).

In summary, previous research has suggested that there may be both benefits and disadvantages of communicating online for individuals with SA. For example, online communication is associated with reduced feelings of anxiety and increased self-disclosure compared to face-to-face communication, but also with problematic internet use and increased avoidance of face-to-face interactions. Online communication has also been associated with lower quality of life and higher depression for individuals with SA. In recent years there has been an increase in the popularity of online social networking sites, such as Facebook. Although there are similarities between communicating on Facebook and other forms of online interactions, there are also differences in terms of the lack of anonymity and the opportunity for passive rather than social Facebook use. Therefore, the benefits and disadvantages of Facebook communication for individuals with SA may be different to those of other forms of online interaction. The aim of this systematic review is to gather and review the evidence on the potential benefits and disadvantages of Facebook use for people with higher levels of SA. To the best of my knowledge, the current systematic review is the first to explore this question. It is hoped that an awareness of the benefits and disadvantages of Facebook use for people with SA will allow mental health clinicians to consider these factors in their work with people with social anxiety.

**Method**

**Study Eligibility**

The criteria for including studies in this review were: a) study written or translated into English, b) used qualitative or quantitative methodology of any study design (e.g. experimental, non-experimental), c) used human participants of any age, d) an empirical study which presented original data, e) article published in a peer-review journal, not a dissertation or conference presentation e) used a validated measure of social anxiety (SA), and f) measured potential benefits and/or disadvantages of using Facebook for those considered to have higher SA.

**Selection of Studies**

Studies were identified through a systematic online search of PsycINFO, PubMed and Web of Science databases. Searches were not restricted by year. Searches were conducted in October 2017. The reference lists of eligible studies were also searched for further relevant articles.

**Search Strategy**

Searches were conducted using the following terms:

1. Terms relating to SA (Social anx\*, social phobi\*, socially anx\*, socially phobi\*, SAD), combined using the Boolean operator ‘OR’
2. Facebook

The Boolean operator ‘AND’ was used to combine the terms relating to SA with Facebook. Searches were conducted in ‘All Fields/All Text’, where the database allowed, or were searched for in ‘Topic’, where it was not possible to search all text.

**Data Collection**

The author screened all online titles and abstracts for eligibility. Articles considered relevant were retrieved in full text and then assessed for eligibility. Data extraction was carried out by one reviewer, using data extraction forms specifically designed for the current review.

**Methodological Quality Assessment**

The methodological quality of the studies was evaluated using the criteria for evaluating cross sectional analytic studies from the Mixed Methods Appraisal Tool (MMAT; Pluye et al., 2011). Although all of the studies included in the review had a cross-sectional design, there are limited tools for assessing the methodological quality of cross-sectional research designs (Sanderson, Tatt, & Higgins, 2007). Those tools that do exist tend to assess the quality of the reporting of the research, rather than its methodological quality (Durant, 1994; Sirriyeh, Lawton, Gardner, & Armitage, 2012; Souto et al., 2015; Wong, Cheung, & Hart, 2008). The MMAT has been shown to be an efficient and reliable quality assessment tool for reviewing the methodological quality of a variety of qualitative and quantitative designs, including cross-sectional (Pace et al., 2012; Souto et al., 2015). For the current review, the MMAT was adapted to include a rating for each area of quality criteria (see Appendix A). Studies were rated as “strong”, “medium” or “weak” in each area, based on the rating scale used in the Effective Public Health Practice Project quality assessment tool for quantitative studies (Thomas, Ciliska, Dobbins, & Micucci, 2004). Methodological quality assessment was carried out by the author, and verified by the author’s supervisor. Any discrepancies were resolved by discussion.

**Results**

A total of 11 studies were included in the systematic review. In line with PRISMA guidelines, the process for selecting studies is summarised in a flowchart in Figure 1. The literature search yielded 138 articles, of which 44 were duplicates. After removing duplicate articles, the titles and abstracts of 94 studies were screened. Twenty-seven relevant papers were identified for full-text screening. Of these, four were excluded because they investigated social networking sites in general and did not explore Facebook use. Five studies were excluded because they did not explore the potential benefits and/or disadvantages of Facebook use and the associations of these with social anxiety (SA). Of these studies, one explored associations between likes/comments received and SA, one explored associations between SA and liking political party pages, one explored whether level of SA could be identified from aspects of an individual’s Facebook profile, one explored associations between level of SA and likelihood of reconnecting with a past associate on Facebook, and one explored associations between levels of SA and how Facebook is viewed. Seven papers were excluded because they did not use a validated measure of SA. This left a total of 11 articles to be included in the systematic review.

The details of included studies are summarised in Table 1.

Figure 1.

*PRISMA diagram*

Records identified through database searching  
(*n = 125*)

Additional records identified through reference lists  
(*n = 13*)

Records excluded  
(*n = 67*)

Did not explore benefits/disadvantages of Facebook use and associations with social anxiety (*n = 55*)

Not published in peer-reviewed journal (*n = 5*)

Not an empirical study (*n = 5*)

Not written/translated into English (*n = 2*)

Records after duplicates removed  
(*n = 94*)

Titles and abstracts screened  
(*n = 94*)

Full-text articles excluded  
(*n = 16*)

Did not explore Facebook use (*n=4*)

Did not explore benefits/disadvantages of Facebook use (*n = 5*)

Did not use validated measure of social anxiety (*n = 7*)

Full-text articles assessed for eligibility  
(*n = 27*)

Studies included in qualitative synthesis  
(*n = 11*)

Table 1.

*Participant and study characteristics and results of studies investigating the potential benefits and disadvantages of Facebook use for people with social anxiety (SA).*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| First author (year) | Design | Recruitment | Setting | Participants (n)  Age (mean (SD), range)  Gender (male n, %)  Ethnicity (n, %) | Relevant Measures | Key Findings |
| Liu (2013) | Cross-sectional; questionnaire | Randomly selected secondary school students | Singapore | **Participants**: 780 **Age**: 13.94 (.90), 13-18yrs.  **Gender**: male n = 383, 49.1% male  **Ethnicity**: Chinese 582 (74.6%); Malay 154 (19.7%); Caucasian 32 (4%); Indian 20 (2.6%); Other 19 (2.4%). | - Questionnaire for Privacy Concern  - Social Anxiety Scale for Adolescents  - Personally Identifiable Information Disclosure | - SA significantly increased privacy concern and indirectly decreased disclosure of personally identifiable information.  - Privacy concern significantly mediated the relationship between SA and decreased disclosure of personally identifiable information,  - The direct effect of SA on disclosure of personally identifiable information was non-significant. |
| Davidson (2014) | Cross-sectional; online questionnaire | University students. Recruited via email. | North America | **Participants**: 336  **Age**: not reported  **Gender**: male n = 101 (30%)  **Ethnicity**: White 269 (80%) | - Liebowitz Social Anxiety Scale  - Facebook Anxiety Scale | - SA significantly positively correlated with Facebook specific anxiety |
| Indian (2014) | Cross-sectional; online questionnaire | Facebook users recruited via postings on Facebook | Australia | **Participants**: 299 (n=105 high SA; n=194 low SA)  **Age**: 28.35 (10.88), range not reported  **Gender**: male n = 42 (14%)  **Ethnicity**: not reported | - Mini Social Phobia Inventory  - Interpersonal Support Evaluation List – Appraisal Subscale (offline version & adapted to measure Facebook social support)  - Satisfaction with Life Scale | - High SA participants had significantly lower perceptions of social support experienced offline than those in the low SA group.  - No significant difference between groups in perceptions of Facebook social support.  - For low SA group, offline social support significantly predicted subjective well-being. Facebook social support explained no additional significant variance.  - For high SA group, only Facebook social support significantly predicted subjective well-being. Offline social support non-significant. |
| McCord (2014) | Cross-sectional; online questionnaire | Facebook users recruited via university research participant pool and Principal Investigator’s email contacts | North America | **Participants**: 216  **Age**: 32.2 (12.43), range 18-69yrs  **Gender**: male n = 31 (14.4%)  **Ethnicity**: White 180 (83.3%); Black 14 (6.5%) Multiracial 8 (3.7%); Hispanic 5 (2.3%); Asian 4 (1.9%); African 1 (.5%); America Indian 1 (.5%); Arab 1 (.5%); Pacific Islander 1 (.5%) | - Facebook Questionnaire  - Social Interaction Anxiety Scale  - Social Phobia Scale  - Facebook Social Interaction Anxiety Scale | - No significant correlation between SA and social Facebook use  - SA significantly positively correlated with anxiety experienced during social Facebook use  - Anxiety on Facebook and interaction between anxiety on Facebook and SA significantly predicted social Facebook use |
| Rauch (2014) | Cross-sectional experimental; random allocation to one of four conditions (1) participants studied face on Facebook only, (2) participants studied face in face-to-face condition, (3) Facebook followed by face-to-face, (4) Face-to-face followed by Facebook | Undergraduate students | North America | **Participants**: 26  **Age**: mean, SD not reported. 18-20yrs  **Gender**: male n = 0 (0%)  **Ethnicity**: not reported | - Interaction Anxiousness Scale (IAS)  - Galvanic skin response as a measure of arousal | -Participants exhibited increased galvanic skin response when observing a person’s face in a face-to-face condition if they had previously observed that person’s face on Facebook, compared to a face-to-face condition alone.  -Interaction between IAS and condition was a significant predictor of arousal. The high arousal levels in the condition in which participants observed another person’s face on Facebook then face-to-face particularly occurred among those participants with higher levels of SA. |
| Lee-Won (2015) | Cross-sectional; online questionnaire | College students, recruited via email | North America | **Participants**: 243  **Age**: 19.69 (1.12), 18-24yrs.  **Gender**: male n = 69 (28.4%)  **Ethnicity**: White 223 (91.8%); African/African American 4 (1.6%); Asian/ Asian American 5 (2.1%); Hispanic American 3 (1.2%); Native American 3 (1.2%); multiracial 5 (2.1%). | - Social Anxiety Scale  - Need for Social Assurance Scale (NSA)  - Problematic Facebook Use Scale | -SA and NSA significantly positively associated with problematic Facebook use  -SA and NSA interaction significantly associated with problematic Facebook use. The positive association between SA and problematic Facebook use was significant for medium and high NSA but not for low NSA. |
| Shaw (2015) | Cross-sectional; questionnaire | Undergraduate psychology students, participated for course credit | North America | **Participants**: 75  **Age**: 19.2 (1.27), 17-24yrs.  **Gender**: male n = 33 (44.8%)  **Ethnicity**: Caucasian (65.8%); American Indian/Alaskan Native (1.3%); Asian (6.6%); African American (5.3%); Hispanic/Latino (13.2%); other (7.9%) | - Social Phobia Scale (SPS)  - Facebook Activity Measure (3 subscales: passive use; content production; interactive communication)  - Ruminative Response Scale (brooding subscale) | - Relationship between passive Facebook use and SPS scores was significant. When controlling for the mediator brooding, this relationship decreased although remained significant.  - Passive Facebook use significantly associated with higher SPS scores |
| Bodroža (2016) | Cross-sectional; online questionnaire | Facebook users. Two samples: sample 1: recruited via online questionnaire through a Facebook page; sample 2: university students who participated as part of course requirements | Serbia | **Participants**: 804  Sample 1:  **Participants:** 445  **Age**: 26.95 (6.35), 15-62yrs  **Gender**: male n = 93 (20.9%)  **Ethnicity**: Not reported  Sample 2:  **Participants:** 359  **Age**: 21.29 (2.96), 18-44yrs.  **Gender**: male n = 74 (20.6%)  **Ethnicity**: Not reported. | - Psycho-social Aspects of Facebook Use Questionnaire  - Fear of Negative Evaluation Scale (FNE) | - FNE score significantly positively associated with compensatory use of Facebook (using Facebook to compensate for personal insecurities and feelings of inadequacy); Self-presentation on Facebook; Socializing and seeking sexual partners through Facebook and Facebook addiction. |
| Green (2016) | Cross-sectional; online questionnaire | Survey distributed via email and Facebook contacts of the researcher | United Kingdom | **Participants**: 306  **Age**: 20.52 (1.45), range not reported  **Gender**: male n = 105 (34.3%)  **Ethnicity**: Not reported. | - Social Anxiety Scale for Adolescents (Social Avoidance and Distress – New People subscale)  - Self-report measures of perception of reduced cues during private & public communication; perception of controllability in private and public Facebook communication; perception of disinhibition in public and private Facebook communication and disclosure offline and in private and public Facebook communication | - SA significantly positively associated with perception of value of reduced cues, controllability and disinhibition in both public and private Facebook communication.  - Perception of reduced cues, and controllability associated with disinhibition and these factors mediated the relationship between SA and Facebook self-disclosure in private but not public communication. |
| Honnekeri (2017) | Cross-sectional; online questionnaire | Undergraduate students recruited through online sources, emails, posters and word of moth | India | **Participants**: 316  **Age**:19.9, SD, range not reported  **Gender**: male n = 111 (35%)  **Ethnicity**: Not reported. | - Social Interaction Anxiety Scale  - Social Phobia Scale  - Self-report questionnaire of Facebook usage patterns | - Those who met criteria for social phobia reported lower satisfaction scores for in-person interactions compared to those without social phobia, but this difference disappeared for Facebook interactions  - Compared to those without social phobia, those with social phobia significantly more likely to report spending time thinking of Facebook or planning how to use it, having tried to cut down on use of Facebook without success and becoming restless or troubled if prohibited from using it. |
| Scott (2017) | Cross-sectional; online questionnaire | Facebook users recruited via adverts on Facebook and Twitter | United Kingdom | **Participants**: 264  **Age**: 31.65 (13.24), range 16-72  **Gender**: male n = 75 (28.4%)  **Ethnicity**: British (78.2%), White European (17.7%), White North American (2%), Mixed Race (1.4%) | - Questionnaire of Facebook behaviours  - Liebowitz Social Anxiety Scale | - SA marginal positive predictor of posting photos of parties, travel and mean frequency of posting photos |

**Patient and Study Characteristics**

Included studies were published between 2013 and 2017. All studies had a cross-sectional quantitative design, with the majority of studies using a questionnaire design, apart from one which used an experimental design. Five of the included studies were set in North America, two in the United Kingdom, one in Singapore, one in Serbia, one in India and one in Australia.

The included studies had a total sample of 3,665 participants, with the sample size ranging from 26 to 804 participants (median: 299; mean: 333). Where the age of participants was reported, ages ranged from 13 to 72 (median: 20.9; mean: 23.4). The majority of studies used a convenience sample, except one which used a randomly selected sample. Three of the included studies recruited a sample of Facebook users, five recruited a sample of university students, one recruited a sample of secondary school students and two used a mixed sample of university students and Facebook users. All studies were conducted with non-clinical samples.

**Measurement of Social Anxiety**

All studies used self-report measures of SA. Two studies used the Liebowitz Social Anxiety Scale, two used both the Social Interaction Anxiety Scale and Social Phobia Scale, one used the Social Phobia Scale alone, one used the Mini Social Phobia Inventory, one used the Social Anxiety Scale, one used the Interaction Anxiousness Scale, one used the Fear of Negative Evaluation Scale, one used the Social Anxiety Scale for Adolescents, and one used the social avoidance and distress – new people subscale of the Social Anxiety Scale for Adolescents.

**Measurement of the Benefits and Disadvantages of Facebook Use**

Numerous different measures were used across the studies to measure the benefits and disadvantages of Facebook use. One study used an objective measure of emotional arousal (galvanic skin response) and ten studies used self-report questionnaire measures. Of these, eight studies used measures which explored Facebook usage patterns and various different Facebook behaviours (such as self-disclosure, use of passive or socially interactive aspects of Facebook and elements of problematic Facebook use), two studies measured Facebook anxiety, one study measured perceptions of Facebook and one study measured interpersonal support on Facebook.

**Consideration of Mediators or Moderators**

The studies included in the review varied with regard to the comprehensiveness of the variables considered in the analyses. Where potential mediators or moderators (e.g. age, gender) were controlled for in the analysis, this is discussed in the confounders section below. In terms of exploring mediators or moderators, seven studies did not explore possible mediators or moderators of the relationship between SA and the benefits and/or disadvantages of Facebook use (Bodroža & Jovanović, 2016; Davidson & Farquhar, 2014; Honnekeri et al., 2017; Indian & Grieve, 2014; Lee-Won et al., 2015; Rauch et al., 2014; Scott et al., 2017). One study considered privacy concern as a possible mediator of the relationship between SA and self-disclosure (Liu, Ang, & Lin, 2013), one study considered level of anxiety on Facebook as a possible moderator of the relationship between SA and social Facebook use (McCord et al., 2014), one study considered brooding as a possible mediator of the relationship between SA and passive Facebook use (Shaw et al., 2015), and one study explored perception of reduced cues, controllability and disinhibition as possible mediators of the relationship between SA and Facebook self-disclosure (Green et al., 2016).

**Overall Quality Assessment.**

Quality assessment ratings of included studies are shown in Table 2.

**Selection bias*.*** Only one study used random sampling (Liu et al., 2013), the remaining ten studies used convenience sampling. Two studies (Green et al., 2016; McCord et al., 2014) recruited participants completely or partially via the email contacts and Facebook connections of the lead researcher. Six studies used a solely student sample.

Table 2.

*Quality assessment of studies investigating benefits and disadvantages of Facebook use for individuals with social anxiety*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| First author (year) | Selection bias | Appropriate measurements | Confounders | Complete outcome data/response rate | Overall quality rating\* |
| Liu (2013) | Strong | Weak | Weak | Weak | Weak |
| Davidson (2014) | Medium | Weak | Weak | Weak | Weak |
| Indian (2014) | Medium | Medium | Medium | Weak | Moderate |
| McCord (2014) | Medium | Weak | Weak | Weak | Weak |
| Rauch (2014) | Weak | Medium | Strong | Strong | Moderate |
| Lee-Won (2015) | Medium | Strong | Strong | Strong | Strong |
| Shaw (2015) | Medium | Medium | Medium | Weak | Moderate |
| Bodroža (2016) | Medium | Weak | Weak | Weak | Weak |
| Green (2016) | Weak | Medium | Medium | Weak | Weak |
| Honnekeri (2017) | Medium | Medium | Weak | Weak | Weak |
| Scott (2017) | Medium | Weak | Weak | Weak | Weak |

\*Overall quality rating: strong = no weak ratings; moderate = one weak rating; weak = two or more weak ratings (Thomas et al., 2004)

**Appropriate measures.** Five studies (Green et al., 2016; Honnekeri, Goel, Umate, Shah, & De Sousa, 2017; Indian & Grieve, 2014; Lee-Won et al., 2015; Shaw et al., 2015) used measures with a clear origin. Five studies (Bodroža & Jovanović, 2016; Davidson & Farquhar, 2014; Liu et al., 2013; McCord et al., 2014; Scott et al., 2017) developed a completely new measure for their study and did not report on the validity of this measure. One study (Shaw et al., 2015) used only the Social Phobia Scale to measure SA, however this scale is intended to be used as a companion measure alongside the Social Interaction Anxiety Scale (Mattick & Clarke, 1998). One study (Green et al., 2016) used a highly shortened version of one subscale of the Social Anxiety Scale for Adolescents to measure SA. Most of the measures used seemed to have face validity, except for that of Rauch et al. (2014) where increased galvanic skin response could have represented either positive or negative emotional arousal. Within the one experimental study (Rauch et al., 2014) there was no evidence of cross-contamination.

**Confounders.** In terms of controlling for confounders in their design and/or analysis, one study controlled for gender (Indian & Grieve, 2014), one study controlled for age and gender (Green et al., 2016), one study controlled for depression and anxiety (Shaw et al., 2015), one study controlled for gender, age and anxiety (Rauch et al., 2014), one study controlled for age, narcissism, loneliness and shyness (Scott et al., 2017), one study controlled for age, sex, ethnicity, household income, agreeableness, conscientiousness, extraversion and neuroticism (Lee-Won et al., 2015) and five studies did not control for any confounders (Bodroža & Jovanović, 2016; Davidson & Farquhar, 2014; Honnekeri et al., 2017; Liu et al., 2013; McCord et al., 2014).

**Complete outcome data/response rate.** One study reported complete outcome data (Rauch et al., 2014), one study included sufficient information to determine a response rate >60% (Lee-Won et al., 2015), the remaining studies did not give sufficient information to determine response rate.

**Overall quality rating.** The overall quality of seven studies was rated as weak (Bodroža & Jovanović, 2016; Davidson & Farquhar, 2014; Green et al., 2016; Honnekeri et al., 2017; Liu et al., 2013; McCord et al., 2014; Scott et al., 2017), three studies were rated as moderate (Indian & Grieve, 2014; Rauch et al., 2014; Shaw et al., 2015) and the overall quality of one study was rated as strong (Lee-Won et al., 2015).

**Study Outcomes**

**Benefits.** Six studies explored the potential benefits of Facebook interaction for individuals with SA.

***Use of Facebook to fulfil social needs****.* In a moderate quality study set in Australia, Indian & Grieve (2014) found that participants with high levels of SA reported significantly lower perceptions of social support experienced offline than those with low SA, however there were no significant differences between the groups in perceptions of Facebook social support. For the low SA group, offline social support was significantly associated with self-reported wellbeing but Facebook social support did not significantly contribute to wellbeing. For the high SA group, Facebook social support was significantly associated with self-reported well-being but offline social support did not significantly contribute to well-being. In a weak quality study set in Serbia, Bodroža & Jovanović (2016) found that higher scores on a measure of SA were significantly positively associated with using Facebook to socialize and seek sexual partners, and with using Facebook as a means of compensating for personal insecurities and feelings of inadequacy in face-to-face settings. One weak quality study set in India found that those who met the criteria for social phobia reported lower satisfaction scores for face-to-face interactions compared to those without social phobia, but this difference disappeared for Facebook interactions (Honnekeri et al., 2017).

***Self-disclosure.*** Three studies explored self-disclosure on Facebook. In a weak quality study set in the United Kingdom, Scott et al. (2017) explored self-disclosure through the posting of photos on Facebook and found that SA was a marginal positive predictor of the mean frequency of posting photos on Facebook and of posting photos of parties and travel, but not other categories of photo such as family, friends or self. In a weak quality study also set in the United Kingdom, Green et al. (2016) found that self-reported perceptions of the value of reduced cues and controllability were associated with disinhibition on Facebook and that reduced cues, controllability and disinhibition mediated the relationship between SA and Facebook self-disclosure in private but not public modes of Facebook communication. In a weak quality study set in Singapore, Liu et al., (2013) found that SA had no direct effect on disclosure of personally identifiable information on Facebook, but that SA indirectly decreased disclosure of personally identifiable information on Facebook through increased privacy concern. These studies differed in terms of the samples used, with Liu et al. (2013) using a sample of secondary school students from Singapore and both Scott et al. (2017) and Green et al. (2016) using samples of Facebook users from the United Kingdom. They also differed in terms of the way self-disclosure was measured; Scott et al. (2017) measured self-reported posting of photos on Facebook, Green et al. (2016) measured self-reported self-disclosure of information to those who participants reported communicating with frequently in both private and public modes of Facebook communication, and Liu et al. (2013) measured self-reported disclosure of information and photos during general Facebook use.

***Associations between particular aspects of Facebook communication and social anxiety.*** Two studies explored the associations between aspects of Facebook communication and SA. In a weak quality study set in the United Kingdom, Green et al. (2016) found that SA was significantly positively associated with self-reported perceptions of the value of reduced cues, controllability and disinhibition during Facebook communication, and that this was the case in both public and private modes of Facebook communication. In another weak quality study set in Serbia, Bodroža & Jovanović (2016) found that higher scores on a measure of SA were positively associated with self-reports of self-presentation on Facebook, for example choosing personal photos and posts to present one’s ideal self or make desired impressions on others.

**Disadvantages***.* Seven studies explored the potential disadvantages of Facebook interactions for individuals with SA.

***Problematic Facebook use****.* Three studies explored associations between SA and problematic Facebook use. In a strong quality study set in North America, Lee-Won et al. (2015) found that whilst SA was significantly positively associated with problematic Facebook use, this significantly interacted with a need for social assurance, which refers to the tendency to rely on others for affiliation and companionship as a way to maintain a sense of belonging. This study suggested that the positive association between SA and problematic Facebook use was significant for those with medium and high levels of need for social assurance but not those with a low need for social assurance. In a weak quality study set in Serbia, Bodroža & Jovanović (2016) found that high scores on a measure of SA were significantly positively associated with self-reported symptoms of Facebook addiction, for example prolonged time spent on Facebook, inability to control use of Facebook, losing sleep, and procrastination of important tasks and responsibilities due to Facebook use. Similarly, in a weak quality study set in India, Honnekeri et al. (2017) found that compared to those without social phobia, those who met the criteria for social phobia were significantly more likely to report spending time thinking of Facebook, having tried to cut down on their use of Facebook without success and becoming restless or troubled if prohibited from using Facebook.

***Increased arousal during subsequent face-to-face encounter.*** In a moderate quality experimental study set in North America, Rauch et al. (2014) found that participants had higher arousal levels when observing another person in a face-to-face condition if they had previously observed the same person on Facebook, compared to when they had just observed the person in the face-to-face condition alone. The high arousal levels in the Facebook followed by face-to-face condition occurred particularly among those participants with higher levels of SA.

***Passive versus social Facebook use.*** Two studies explored the associations between SA and types of Facebook use. In a weak quality study set in North America, Shaw et al., (2015) found that SA was significantly positively associated with passive Facebook use. In a weak quality study also set in North America, McCord et al. (2014) found no significant association between SA and social Facebook use in a sample of Facebook users. They also found that anxiety on Facebook and the interaction between anxiety on Facebook and SA significantly predicted social Facebook use, such that among people with high anxiety on Facebook, people with high SA engaged in social Facebook use more frequently than people with low SA. This was not the case for people with low anxiety on Facebook. These studies differed in terms of the samples used, with one study using a sample of Facebook users and the other a sample of university students. They also differed in terms of the scales used to measure social and passive aspects of Facebook use.

***Feelings of anxiety on Facebook.*** Two studies explored associations between SA and feelings of anxiety when using Facebook. In a weak quality study set in North America, Davidson and Farquhar (2014) found that SA was significantly positively associated with Facebook specific anxiety (anxiety engaging in particular tasks on Facebook, such as showing awkward pictures of oneself or uploading pictures that others may not like). In a weak quality study also set in North America, McCord et al. (2014) found that SA was significantly positively correlated with anxiety experienced during social Facebook use.

**Discussion**

The aim of this systematic review was to gather and review the evidence on the potential benefits and disadvantages of Facebook use for people with social anxiety (SA). Eleven studies met the criteria for inclusion in the review. Study findings identified a number of potential benefits and disadvantages of Facebook use for individuals with SA.

**Benefits of Facebook Use for People with Social Anxiety**

The findings of the current review suggested that a potential benefit of using Facebook for people with SA is that Facebook provides a setting in which these individuals can have satisfying interactions during which they can fulfil their social needs and receive social support. These findings fit with the social compensation hypothesis of online communication, which suggests that the internet particularly benefits socially anxious individuals who find it harder to develop friendships in real life, as it provides an alternate method of building social relationships and communicating with others (Valkenburg et al., 2005). Thus, Facebook appears to be associated with similar benefits as other forms of online communication for individuals with SA. The findings of the current review also fit with suggestions that online settings may provide a particularly valuable source of social support for individuals with mental health difficulties (Dobrean & Păsărelu, 2016), especially for those with SA who find building face-to-face social relationships more difficult (Green et al., 2016). Furthermore, the current review suggests that for those with high levels of SA there are associations between receiving social support on Facebook and wellbeing. This may be a further benefit of Facebook use for these individuals. However, although there may be benefits of deriving support online for individuals with SA, it has been suggested that for these individuals, deriving social support online may be associated with increased avoidance of face-to-face social interactions, which perpetuates feelings of SA (Indian & Grieve, 2014). There are also associations between online social support and Facebook addiction (Tang, Chen, Yang, Chung, & Lee, 2016), which may be a further disadvantage of using Facebook to fulfil social needs for those with SA.

The current review provided some support to suggest that people with high SA self-disclose more frequently on Facebook compared to those with low SA, particularly in more private modes of Facebook communication. This supports previous research, which suggests that individuals with SA feel better able to express their real selves and engage in more frequent self-disclosure online (Weidman et al., 2012). Increased self-disclosure could be a potential benefit of using Facebook for individuals with SA, since self-disclosure is an important part of building and maintaining social relationships (Buhrmester & Furman, 1987; Green et al., 2016), yet individuals with high SA self-disclose less frequently during face-to-face interactions than those with low SA (Meleshko & Alden, 1993). It is important to note that the studies included in the current review did not directly explore self-disclosure on Facebook compared to real-life settings, therefore, it cannot be determined from this research whether individuals with high SA feel better able to self-disclose on Facebook compared to face-to-face. One study included in this review found that SA was a marginal positive predictor of the mean frequency of posting photos on Facebook and of posting photos of parties and travel, but not other categories of photo such as family, friends or self. This suggests an association between SA and self-disclosure on Facebook via the medium of sharing personal photos, however the actual photos that those with SA are sharing seem to be less personal in nature. Therefore, increased photo posting amongst those with SA may not actually equate with increased self-disclosure.

One study included in this review did not find a direct effect of SA on self-disclosure of personal information on Facebook, but found that SA indirectly decreased disclosure of personally identifiable information through increased privacy concern. This suggests that individuals with high levels of SA may be just as likely as those with low levels of SA to self-disclose on Facebook, but those with high SA and high privacy concern are less likely than those with low SA to self-disclose. The results of this research, conducted in a non-Western adolescent sample, appear to contrast with the findings of other studies included in the review, which used Western adult samples. It is possible that differences in terms of age and culture between these samples may explain the contrasting findings, since it has been suggested that patterns of self-disclosure may change as one ages (Buhrmester & Prager, 1995). Research also suggests that those from non-Western cultures tend to self-disclose less frequently than those from the West (Chen, 1995).

There was also some evidence from this review that individuals with SA self-disclose more frequently in private, compared to public modes of Facebook communication. Private modes of Facebook communication allow the user to communicate with a small number of chosen others (Green et al., 2016). For those with SA, it is possible that this may be associated with reduced concerns around privacy and self-disclosure, since information is not being shared publically and the individual can choose with whom they wish to self-disclose. It is possible that this may explain the significant results found for increased self-disclosure in private but not public modes of Facebook communication for those with SA, although this was not directly explored in the studies included in the current review.

The findings of the current review also suggested that high levels of SA were associated with valuing particular aspects of Facebook communication (e.g. controllability and reduced visual cues, such as appearance and body language) as well as increased feelings of disinhibition and increased control of self-presentation on Facebook. These findings support previous research in other online settings which has shown that individuals with high levels of SA value the reduced cues and controllability of online environments (Caplan, 2007; Erwin et al., 2004; Lee & Stapinski, 2012; Peter & Valkenburg, 2006; Shepherd & Edelmann, 2005; Young & Lo, 2012). It has been suggested that these aspects of online communication may contribute to reduced feelings of anxiety and distress in online compared to face-to-face settings (Caplan, 2007; Indian & Grieve, 2014; Valkenburg et al., 2005; Zywica & Danowski, 2008). This may be a potential benefit of communicating on Facebook for individuals with SA. It has also been suggested that the increased controllability of Facebook communication allows individuals with SA greater control over their self-presentation, which reduces their fear of making a negative impression on others (Caplan, 2007). However, the studies included in the current review explored whether individuals with SA value reduced cues and controllability on Facebook, rather than whether these aspects of Facebook communication actually lead to reduced anxiety and fear. This could be explored in future research. It is also possible that controlling self-presentation on Facebook may be disadvantageous for people with SA, since they may attribute success in online environments to increased control of self-presentation, which may further reduce their confidence communicating face-to-face (Lee & Stapinski, 2012).

**Disadvantages of Facebook Use for People with Social Anxiety**

This review also suggested some disadvantages of Facebook use for people with SA. Three studies suggested an association between high SA and problematic Facebook use, for example spending prolonged time spent on Facebook, inability to control how often Facebook is used, losing sleep, and procrastination of important tasks and responsibilities due to Facebook use. This fits with previous research suggesting an association between SA and problematic internet use (Aladwani & Almarzouq, 2016; Caplan, 2007; Cuhadar, 2012; Lee & Stapinski, 2012; Prizant-Passal et al., 2016; van den Eijnden et al., 2008). One strong quality study included in the current review suggested that need for social assurance may play a role in the development of problematic Facebook use, with the association between SA and problematic Facebook use significant only for those with medium and high levels of need for social assurance. Need for social assurance refers to the tendency to rely on others for affiliation and companionship as a way to maintain a sense of belonging and it has been suggested that Facebook interactions provide a way through which people can quickly satisfy their needs for social assurance (Lee-Won et al., 2015). Importantly, it is thought that the quick access to interactions which fulfil needs for social assurance via Facebook may lead to problematic Facebook use in some individuals (Lee-Won et al., 2015). Problematic internet use is associated with negative social, academic and professional consequences, for example isolation from friends and family and reduced engagement in pleasurable activities (Caplan, 2007; Davis, 2001). Given the similarities between Facebook and other forms of online communication it is possible that problematic Facebook use may also be associated with similar negative outcomes. Therefore, given the association between high levels of SA and problematic Facebook use, those with SA may be at risk for some of the disadvantages associated with problematic internet use. However, the long-term negative outcomes of problematic Facebook use were not directly explored by the studies included in the current review.

The results of the current review suggested that a further disadvantage of Facebook use for people with SA was increased arousal during subsequent face-to-face interactions. Rauch et al. (2014) found that when observing another person face-to-face after previously studying that person’s face on a Facebook profile page, individuals with high SA were more likely to exhibit high physiological arousal. Rauch et al. (2014) interpreted these results to suggest that exposure to someone on Facebook is associated with increased negative emotions (e.g. agitation) when that person is encountered face-to-face, particularly for individuals with high SA. However, physiological arousal can signify positive as well as negative emotions, therefore an alternative interpretation of these results is that the increased arousal in a subsequent face-to-face meeting signified a more positive emotional state (e.g. happiness or excitement; Rauch et al., 2014). Since the researchers did not include any self-report measures of participant’s emotional states, it is difficult to confirm which interpretation is correct. Furthermore, the ecological validity of this study is fairly low. Participants were required to study a stimulus person’s face on a Facebook profile page, which would be an unusual way to interact with someone on Facebook prior to a face-to-face meeting. One might reasonably be expected to look at that person’s wall and photos or even communicate directly through chat or wall posts. Indeed, research suggests that an initial internet chat introduction actually reduces self-reported anxiety amongst socially anxious individuals during a subsequent face-to-face encounter (Markovitzky, Anholt, & Lipsitz, 2012). It is possible similar results may be found after more active prior face-to-face communication on Facebook. Further research could investigate this.

The research included in the current review suggested a significant association between high levels of SA and increased passive Facebook use (Shaw et al., 2015). There was also a significant relationship between high SA and social Facebook use, however, this was only in the context of moderation by levels of anxiety on Facebook, such that individuals with high SA and high anxiety on Facebook engage in social Facebook use more frequently than people with low SA (McCord et al., 2014). This finding is thought to be consistent with the idea that people with SA turn to Facebook to fulfil their social needs due to the discomfort they experience in face-to-face social interactions, since high SA may motivate social Facebook use even when anxiety is experienced on Facebook (McCord et al., 2014). Indeed, the research included in the current review suggested an association between SA and anxiety on Facebook, perhaps indicating that interacting on Facebook does not completely reduce the anxiety that individuals with SA experience during social interactions with others.

That there are associations between high SA and both passive and social Facebook use is an interesting finding, since one might reasonably expect that increased passive Facebook use would be associated with reduced social Facebook use. Previous research has shown that individuals with higher levels of SA report spending more time on Facebook than those with low SA (Murphy & Tasker, 2011; Shaw et al., 2015). It may be that this includes both social and passive use, whereas individuals with lower levels of SA perhaps mostly use the social features of Facebook. The difference in findings in these two studies may also be explained by differences in age between the samples, since McCord et al. (2014) used participants with a mean age of 32, whereas those of Shaw et al. (2015) had a mean age of 19. It has been suggested that older Facebook users are more likely than younger Facebook users to use the social aspects of Facebook (Target Internet, 2017). These age differences in Facebook use may also be present in those with SA, which may explain the discrepant findings.

The current review suggested an association between high SA and passive Facebook use, which is a concerning finding. Passive Facebook use is associated with negative outcomes, such as reduced feelings of bonding with others and increased loneliness, compared to more direct forms of Facebook communication (Burke et al., 2010; Burke et al., 2011). Therefore, if individuals with high SA do indeed interact more passively on Facebook this is likely to be disadvantageous. Future research could explore both passive and social Facebook use amongst a sample of Facebook users with high SA, since it may be that those with SA use Facebook in both a social and passive manner. It would also be useful for future research to explore the longitudinal outcomes of passive Facebook use for individuals with SA.

**Summary of Findings**

In summary, the current review identified both potential benefits and disadvantages of Facebook use for individuals with SA. The potential benefits included more satisfying interactions on Facebook and using Facebook to fulfil social needs and derive social support, which was associated with improved wellbeing, as well as reports of valuing certain aspects of Facebook communication, which may be associated with reduced anxiety. There was also some evidence suggesting increased self-disclosure on Facebook for individuals with SA, particularly in private modes of Facebook communication. The potential disadvantages of Facebook use for individuals with SA included increased likelihood of problematic Facebook use, increased arousal during subsequent face-to-face interactions, increased passive Facebook use and feelings of anxiety when using Facebook.

**Implications**

This information may have implications for the treatment of social anxiety disorder (SAD). It has been suggested that when working with individuals with SAD who use Facebook, clinicians may consider including Facebook interactions in the development of fear hierarchies and exposure exercises (Erwin et al., 2004; Yen et al., 2012). Since individuals with SA appear to value particular aspects of Facebook communication, which may be associated with reduced anxiety, individuals with high levels of SA may find it easier to carry out exposure exercises on Facebook than face-to-face. However, clinicians should also consider that online interactions may serve as a form of safety behaviour through which individuals with SA can avoid threatening face-to-face interactions, which may then lead to problematic internet use (Lee & Stapinski, 2012). Thus, caution is needed when including internet communication as an exposure exercise in therapy, or when delivering therapy via the internet. The goal of therapy for SAD should always be to decrease face-to-face SA (Yen et al., 2012). In addition, individuals with SA should be encouraged to achieve a healthy balance between social interactions on Facebook and face-to-face (Lee-Won et al., 2015). It may also be important for clinicians to promote awareness of the potential disadvantages of Facebook use for people with SA, since the use of Facebook has now become widespread in society (Facebook, 2018).

In addition, there is some preliminary research which has explored mental health interventions delivered via Facebook (Dobrean & Păsărelu, 2016). For example, Hui, Wong and Fu (2015) found that a depression awareness campaign delivered via Facebook was associated with enhanced mental health literacy. Research also suggests that interventions delivered via social networking sites may be an effective way of promoting changes in health-related behaviours (Laranjo et al., 2014). It has been suggested that individuals with high SA may avoid seeking face-to-face interventions due to the anxiety they experience face-to-face (Carlbring et al., 2007). Since those with SA appear to value spending time on Facebook (Murphy & Tasker, 2011; Shaw et al., 2015) it may be a useful setting in which to promote low-level interventions for SAD and may also have a role in promoting access to online therapy (Indian & Grieve, 2014). Future research could investigate the feasibility of this.

**Limitations and Future Research**

When considering the findings of this review it should be noted that the included studies had a number of limitations which could potentially affect the interpretation and generalisability of the findings. All of the included studies had a cross-sectional design; therefore, the direction of causality between SA and the potential benefits and disadvantages of Facebook use cannot be determined. Longitudinal research is needed to further clarify the potential benefits and disadvantages of Facebook use for people with SA over time. Furthermore, the majority of the studies included in this systematic review were given an overall weak quality rating, with the quality of only two studies rated as moderate overall and one study receiving an overall strong quality rating. Therefore, further strong quality research is needed in order to allow firm conclusions to be drawn about the potential benefits and disadvantages of Facebook use for individuals with SA. In addition, the majority of the studies included in this review used convenience sampling, thus the samples recruited are likely to have been biased and are perhaps unlikely to be representative of the population of Facebook users as a whole. Furthermore, all studies used non-clinical samples. Although there is thought to be a continuum of SA in the general population (Kashdan, 2007; Morrison & Heimberg, 2013), since no studies were conducted with individuals who met the criteria for a diagnosis of SAD we can only hypothesise that similar findings would be found in individuals with more functionally impairing levels of SA.

The included studies used a number of different self-report tools to measure SA and the diversity in measurements potentially raises questions about whether the construct of SA was accurately measured across all studies. Some scales, such as the Social Interaction Anxiety Scale and Social Phobia Scale, have been shown to have weaknesses and inconsistencies in their underlying factor structures (Wong, Gregory, & McLellan, 2016). It has also been noted that self-report measures of SA for both adults and adolescents need to be updated to be consistent with DSM-5 diagnostic criteria (Wong et al., 2016). Furthermore, one study included in this review used only the Social Phobia Scale to measure SA (Shaw et al., 2015). This scale is intended to be used as a companion measure alongside the Social Interaction Anxiety Scale (Mattick & Clarke, 1998), since the Social Phobia Scale only assesses the domain of performance fear in SA (Dobrean & Păsărelu, 2016). There is also some doubt as to the validity of the measure of SA used in one study included in this review (Green et al. 2016), which used a highly shortened version of one subscale of the Social Anxiety Scale for Adolescents. It is unclear why the researchers chose to use only this subscale to measure SA, rather than considering all the factors that make up this scale. Finally, all studies included in the review used self-report measures of SA and ten studies used self-report measures of the benefits and disadvantages of Facebook use. There are a number of potential validity problems associated with self-report data, for example response bias and poor introspective ability (Barker, Pistrang, & Elliot, 2016), which may have affected the validity of these measures.

Whilst the studies included in the current review have a number of limitations, this systematic review itself also has some limitations, which may affect the conclusions that can be drawn. A literature search was conducted of electronic databases which consist mainly of published journal articles, and only peer-reviewed empirical articles were included in the review. Grey literature such as dissertations or conference presentations was not discussed. Hence, it is likely that the results of this systematic review were affected by publication bias. Furthermore, due to resource constraints, the selection of studies for inclusion in the review was conducted by only one reviewer, yet it is considered best practice for at least two reviewers to be involved in this process (Petticrew & Gilbody, 2004). This is likely to have introduced selection bias into the review, for example perhaps meaning that some relevant studies were missed or not included, which may have impacted on the results.

**Conclusions**

In conclusion, the aim of this systematic review was to gather and review the evidence on the potential benefits and disadvantages of Facebook use for people with SA. Eleven studies were included in the review, which suggested that there may be both benefits and disadvantages of Facebook use for people with SA. The potential benefits of Facebook use for people with SA included being able to use Facebook to fulfil social needs and gain social support, with some evidence of increased self-disclosure in private modes of Facebook communication. The potential disadvantages of Facebook use for individuals with SA included increased likelihood of problematic Facebook use, increased arousal during subsequent face-to-face interactions, increased passive Facebook use and feelings of anxiety when using Facebook. However, the studies included in this review had a number of limitations, which may affect the interpretation and generalisability of the findings. All research was cross-sectional and generally of a weak quality, with the majority of studies recruiting participants through convenience sampling and using self-report measures. There were also limitations to the current review since bias may have been introduced by including only published studies and the review being conducted by only one reviewer. Future, strong quality, longitudinal research which explores the potential benefits and disadvantages of Facebook use for people with SA is required. Future research could also explore the feasibility of delivering low-level interventions and promoting access to online therapy for people with SAD via Facebook. Due to the current omnipresence of social media in everyday life, it seems important that clinicians working with people with SA consider Facebook use in their work with these individuals, since the results of the current review suggest that there may be some significant benefits and disadvantages of Facebook use for people with SA.

**Empirical Study**

**Social Anxiety and Facebook Use: Exploring Predictors of Comfort Interacting on Facebook and Face-to-Face in People with High and Low Levels of Social Anxiety**

Abstract

Facebook has become an increasingly popular way to interact socially with others, yet little previous research has investigated whether those with social anxiety (SA) feel more comfortable interacting on Facebook compared to face-to-face, or the factors that contribute to feelings of comfort. In this research, 43 participants with high SA and 51 participants with low SA completed online questionnaires. These explored feelings of comfort interacting on Facebook and face-to-face and some factors hypothesised to contribute to comfort in these settings based on the cognitive behavioural model of SA: negative cognitions, safety behaviours and impression management. The results suggested that those with high SA felt more comfortable than those with low SA interacting on Facebook, although this association became non-significant when controlling for behaviours, thoughts and impression management. The combination of safety behaviours, negative cognitions and impression management explained a large amount of the variance in comfort interacting on Facebook versus face-to-face. False-self presentation face-to-face was significantly positively associated with comfort on Facebook. Real-self presentation face-to-face approached significance as being independently associated with comfort on Facebook. Since social interactions are increasingly taking place on social media, clinicians working with those with SA may wish to consider social media interactions within therapy. This research is limited by the cross-sectional design and the self-report measures used, which may affect the conclusions that can be drawn.

**Introduction**

The aim of this research was to investigate predictors of comfort interacting on Facebook and face-to-face in individuals with high and low levels of social anxiety (SA). The research aimed to explore whether the core features of SA suggested by the cognitive behavioural (CBT) model (negative cognitions, safety behaviours and impression management; Clark & Wells, 1995) were associated with comfort interacting on Facebook and face-to-face, and whether these associations differed for individuals with high and low levels of SA. Since social networking sites have become an increasingly popular way to interact socially with others (Baker & Jeske, 2015; Eraslan-Capan, 2015; Weidman et al., 2012), an awareness of the factors that contribute to comfort on Facebook and face-to-face may be important to consider when working psychologically with people with SA.

Social anxiety disorder (SAD) is a common mental health difficulty in which people experience intense fear and anxiety around social or performance situations and worry that in such situations they may do or say something to embarrass themselves. As a result, these situations are avoided or endured with intense feelings of distress (American Psychiatric Association, 2013). Feelings of SA are thought to exist on a continuum (Morrison & Heimberg, 2013) and only about half of those who would meet criteria for a diagnosis of SAD ever seek treatment (Stein & Stein, 2008). Therefore, there are likely to be high levels of SA in non-clinical populations.

Given the fear and anxiety experienced around social situations, it has been suggested that online interactions may be a preferable medium through which people with SA can fulfil their social needs, whilst avoiding the distress experienced face-to-face (Green, Wilhelmsen, Wilmots, Dodd, & Quinn, 2016). There are aspects of online environments that may be preferred by individuals with SA, for example anonymity, reduced visual cues, and temporal flexibility, which allows users more control over how they respond (Caplan, 2007; Green et al., 2016; Madell & Muncer, 2006; McKenna, Green, & Gleason, 2002; Peter & Valkenburg, 2006). Furthermore, online social networking sites allow users to strategically control their self-presentation (Casale, Fioravanti, Flett, & Hewitt, 2015), which may be valued by individuals with SA who generally desire to convey a favourable impression to others (Caplan, 2007).

A number of research studies have suggested that individuals with SA report feeling more comfortable and less anxious when interacting online compared to face-to-face (Caplan, 2007; Erwin, Turk, Heimberg, Fresco, & Hantula, 2004; Martončik & Lokša, 2016; Pierce, 2009; Prizant-Passal, Shechner, & Aderka, 2016; Shepherd & Edelmann, 2005; Weidman et al., 2012; Yen et al., 2012). A recent meta-analysis suggested that the absence of non-verbal cues and the temporal flexibility of online interactions contributed to feelings of comfort interacting online for those with SA (Prizant-Passal et al., 2016). However, the researchers also suggested a need to identify further factors contributing to comfort online (Prizant-Passal et al., 2016).

It has been suggested that the CBT model of SA (Clark & Wells, 1995) might be a helpful framework through which to understand the psychological factors underpinning online communication in those with SA (Young & Lo, 2012). The CBT model suggests that SA is maintained by negative cognitions that one will behave in an unacceptable fashion socially and by safety behaviours (Clark & Wells, 1995). Safety behaviours are behaviours or mental processes used to prevent or minimise the occurrence of feared outcomes which reduce feelings of anxiety in the short-term but inadvertently maintain SA because the non-occurrence of the feared outcome is ascribed to the safety behaviour, rather than the individual concluding that the situation was not as dangerous as they thought (Clark, 2001). A desire to convey a favourable impression of oneself to others is a particular safety behaviour subtype which is also thought to be a core feature of SA (Clark & Wells, 1995; Plasencia, Alden, & Taylor, 2011). Negative cognitions are thought to increase feelings of anxiety for those with SA, whilst safety behaviours are thought to reduce feelings of anxiety in the short-term (Clark, 2001). Negative cognitions, safety behaviours and impression management may be helpful in understanding why individuals with SA feel more comfortable online.

Indeed, some previous research has suggested that cognitions may be important in understanding why people with SA prefer online interactions. Shepherd and Edelmann (2005) and Lee and Stapinski (2012) found that individuals higher in SA reported that they perceived a decreased risk of negative evaluation from others in online compared to face-to-face interactions. In addition, Young and Lo (2012) showed that cognitions related to a fear of negative evaluation from others actually mediated the link between SA and preference for online communication. This research suggests that negative cognitions related to a fear of negative evaluation from others during online interactions may be important in understanding why individuals with SA feel more comfortable online. However, this has not been directly explored in previous research. Furthermore, previous research has only explored the role of cognitions related to a fear of negative evaluation from others, yet there are likely to be various other negative cognitions present in SA, for example about the self or one’s performance (Wells, Stopa, & Clark, 1993). The current research will explore whether the full breadth of cognitions likely to be present in SA are associated with comfort online.

In addition to negative cognitions, the CBT model suggests that safety behaviours are an important maintenance factor of SA (Clark & Wells, 1995). Some previous research has considered safety behaviours in relation to online interactions in individuals with SA. For example, Lee and Stapinski (2012) found that the relationship between SA and preference for online social interaction was partially mediated by the tendency to use safety behaviours face-to-face, suggesting that online interaction could in itself be considered a safety behaviour which individuals with SA use to avoid interacting face-to-face (Lee & Stapinski, 2012). Indeed, Erwin et al. (2004) found that individuals with SA reported that they preferred interacting online because they could avoid feared aspects of face-to-face situations, for example they could conceal visible signs of anxiety. However, although previous research has suggested that online interactions may be used by individuals with SA to avoid the aspects of face-to-face interactions that they fear, research has not explored other forms of avoidance that individuals with SA may use when interacting online, for example avoiding attracting attention from others (Clark et al., 1995). Furthermore, previous research has not explored whether the use of safety behaviours online is associated with levels of comfort. The current research will aim to explore the full breadth of safety behaviours likely to be present in SA and their associations with comfort online.

The CBT model also suggests that the desire to convey a favourable impression of oneself to others is a core feature of SA (Clark & Wells, 1995). Online interactions, particularly social networking sites, allow individuals complete control over their self-presentation and allow the opportunity to present a favourable impression of oneself (Amichai-Hamburger & Vinitzky, 2010; Casale et al., 2015; Mehdizadeh, 2010; Zywica & Danowski, 2008). Some previous research has explored the links between SA and impression management online. For example, Bodroža and Jovanović (2016) found that SA predicted presentation of the ideal self on Facebook, suggesting that individuals with SA are more likely to engage in impression management on Facebook. However, the researchers did not investigate whether impression management was associated with comfort online, which will be explored in the current research. In contrast, McKenna et al. (2002) found that participants higher in SA reported that they were more likely to portray their true selves online than face-to-face, suggesting that individuals with SA do not attempt to manage the impression that they present online. However, this study was conducted prior to the advent of social media, when online communication mainly consisted of anonymous text-based interfaces (Erwin et al., 2004). This may explain the discrepancy in findings compared to the research by Bodroža and Jovanović (2016), which explored Facebook interactions.

Indeed, it is important to acknowledge that the majority of existing research has not looked at interactions on social media, but rather at online interactions more generally. However, interactions on social networking sites differ from other online interactions since social networking interactions are not completely anonymous and tend to take place within the user’s network of established ‘friends’ (Mehdizadeh, 2010; Rauch et al., 2014; Sheldon, 2008). Social networks can also be used more passively, for example viewing other’s profiles without commenting or broadcasting updates to large audiences (Burke, Kraut, & Marlow, 2011; Rauch, Strobel, Bella, Odachowski, & Bloom, 2014; Shaw, Timpano, Tran, & Joorman, 2015). Furthermore, the users of social networking sites are often different to those who interact in other ways online, meaning that generalising results is not recommended (Zywica & Danowski, 2008). With this in mind, the results of the majority of the research discussed thus far may not be applicable to understanding interactions on social media.

Social media use has exploded over recent years and is a popular form of social network through which people can extend their social circles and maintain relationships (Green et al. 2016; Indian & Grieve, 2014; Weidman et al., 2012). However, a recent meta-analysis found minimal research into SA and the factors contributing to comfort interacting on social networking sites, and it was suggested that further investigation of the factors which contribute to the comfort of individuals with SA whilst interacting on social networking sites is required (Prizzant-Passal et al., 2016).

In summary, previous research has shown that individuals with SA report feeling more comfortable online, perhaps because of the absence of non-verbal cues and the temporal flexibility of online interactions. However, it has been suggested that there is a need to identify further factors which contribute to comfort interacting online in individuals with SA. Using the CBT model as a guiding framework, previous research has suggested that negative cognitions, safety behaviours and impression management may be important in understanding why individuals with SA feel more comfortable interacting online. However, the full breadth of negative cognitions and safety behaviours and their associations with comfort interacting online have not been directly explored in previous research. Furthermore, limited previous research has looked at social media interactions and it has been suggested that further research looking at the factors which contribute to the comfort of individuals with SA whilst interacting on social media is required.

The proposed research study aims to fill some of these gaps and extend previous research by exploring whether individuals with high SA feel more comfortable when interacting on Facebook, a widely used online social networking site (Facebook, 2018; Ofcom, 2017). The research will explore whether negative cognitions, safety behaviours and impression management on Facebook are associated with comfort interacting in this setting, as well as exploring these associations in face-to-face settings to see whether there are differences between the psychological processes underlying online compared to face-to-face interactions. These associations will be explored in individuals with high levels of SA, as well as in those with low SA. As age, gender and depression have been found to be associated with both SA and online interactions (Ohayon & Schatzberg, 2010; Prizant-Passal et al., 2016; Shaw & Gant, 2002; Thayer & Ray, 2006), these variables will be controlled for in the analyses. Furthermore, since little previous research has explored the factors that contribute to feelings of comfort for those with SA on social networking sites, a qualitative element will also be included in this research. This will explore whether participants report feeling more comfortable on Facebook and face-to-face and the factors that contribute to levels of comfort.

Based on previous research it is predicted that SA will be associated with comfort interacting on Facebook, and that compared to those with low SA, individuals with high SA will report greater feelings of comfort interacting on Facebook versus face-to-face (Hypothesis 1). Since the CBT model suggests that negative cognitions increase feelings of anxiety for those with SA, whilst safety behaviours reduce feelings of anxiety (Clark, 2001), it is predicted that in both Facebook and face-to-face settings, increased negative cognitions will be associated with a reduction in feelings of comfort (Hypothesis 2), increased safety behaviour use will be associated with an increase in feelings of comfort (Hypothesis 3) and increased use of impression management strategies will be associated with increased feelings of comfort (Hypothesis 4). This research will also explore what other factors participants think contribute to their levels of comfort interacting in the setting in which they feel most comfortable (Facebook or face-to-face; Research Question 1)?

**Method**

Ethical approval for this research was granted by the Royal Holloway Research Ethics Committee (Appendix B).

**Participants**

**Final sample**. In total, 94 participants were recruited; 43 who met the criteria for high social anxiety (SA) and 51 who met the criteria for low SA. Please see Table 3 for relevant participant characteristics. There were no significant associations between the high and low SA groups and participant gender (*χ*2(1) = 1.02, *p*=.313) or ethnicity (*χ*2(5) = 3.73, *p*=.589). Those in the high SA group were significantly younger than those in the low SA group (*U* = 445, *p*<.001) and scored significantly higher on a measure of depression (*U* = 618.5, *p*<.001).

**Recruitment**. To gather the sample, potential participants were recruited from the Royal Holloway participant pool, via advertisements placed around the university campus, and via the Facebook contacts of the researcher. Participants were also invited to forward the link to others who may be interested in taking part. Participants were required to be over 18 years of age and to have a Facebook account which they used.

Table 3.

*Participant characteristics*

|  |  |  |
| --- | --- | --- |
|  | Low Social Anxiety  *n = 51* | High Social Anxiety  *n = 43* |
| Gender: female n (%) | 37 (72.5%) | 35 (81.4%) |
| Age: mean (sd, range) | 33.92 (11.02, 19-65) | 24.40 (6.56, 18-41) |
| Ethnicity: n (%) | White British: 35 (68.63)  Other White: 11 (21.57)  Mixed/Multiple: 1 (1.96)  Asian British: 1 (1.96)  Other Asian: 2 (3.92)  Black British: 1 (1.96) | White British: 28 (65.12)  Other White: 6 (13.95)  Mixed/Multiple: 2 (4.65)  Asian British: 4 (9.3)  Other Asian: 2 (4.65)  Black British: 1 (2.33) |
| PHQ-9 score: mean (sd) | 2.61 (2.71) | 5.21 (3.79) |

In total, 244 people were screened online for SA and mental health difficulties using the Brief Fear of Negative Evaluation Scale (bFNES; Leary, 1983), Albany Panic and Phobia Questionnaire, social phobia subscale (APPQSP; Brown, White & Barlow, 2005) and Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer & Williams, 2001). As part of the screening process, participants were also asked whether they were currently being treated for a mental health difficulty.

Participants who reported suicidality on the PHQ-9 or who were being treated for a mental health difficulty were excluded from the study at the screening stage and were automatically presented with a debrief page[[1]](#footnote-1). This was to remove the possibility that the results would be confounded by coexisting mental health difficulties. Based on the protocol used by Bolt, Ehlers and Clark (2014) and Canvin, Janecka and Clark (2016) participants were allocated to the high or low SA groups as follows: those who scored ≤33 on the bFNES and ≤16 on the APPQSP were considered to have low SA and those who scored ≥40 on the bFNES and ≥19 on the APPQSP were considered to have high SA. Participants who did not meet the criteria for low or high SA were excluded.

Of the 244 participants screened, 149 were excluded: 102 due to not meeting the criteria for high or low SA, 29 due to reporting suicidality, 13 who said that they were currently being treated for a mental health difficulty and six due to substantial missing data. This left a total sample of 94 participants.

An a-priori G\*power analysis was used to calculate the sample size required to detect improvements in the multiple regression model, to explore Hypothesis 1 and Research Question 1. This suggested that to achieve a power of 0.8 and a medium effect size, when adding four predictors to the regression model at each step and with 20 predictors altogether (12 main predictors and eight interactions), 86 participants would be required. A post-hoc power analysis with a sample of 94 participants and an obtained R2 value of 0.565 suggested that the power obtained was 0.99.

**Measures**

**Social anxiety.**The bFNES (Leary, 1983) and APPQSP (Brown et al., 2005) were used to identify levels of SA. The bFNESis a 12-item measure on which participants indicate their concern about negative evaluation from others (e.g. ‘I worry about what other people will think of me even when I know it doesn't make any difference’) on a 5-point Likert scale, ranging from 1 (‘not at all characteristic of me’) to 5 (‘extremely characteristic of me’). Scores for each item are totalled and four items are reverse scored. Scores range from 12-60, with higher scores indicating greater concern about negative evaluation. The bFNES has high levels of reliability and good construct validity (Collins, Westra, Dozois, & Stewart, 2005; Leary, 1983). The reliability in the current sample was excellent (α = .94).

The APPQSPis a 10-item measure on which participants rate their fear in different social situations (e.g. giving a speech, meeting strangers) on a 9-point scale, ranging from 0 (‘no fear’) to 8 (‘extreme fear’). Scores for each item are totalled and scores range from 0-80, with higher scores indicating greater fear in social situations. The APPQSP has high levels of reliability and good construct validity (Brown et al., 2005). The reliability in the current sample was excellent (α = .91).

**Depression.**The PHQ-9 (Kroenke et al., 2001)was used to screen for depression and suicidality.This is a well-known 9-item questionnaire on which participants rate how often they have experienced different symptoms of depression in the last two weeks on a 4-point Likert scale, ranging from 0 (‘not at all’) to 3 (‘nearly every day’). Scores for each item are totalled and scores range from 0-27, with higher scores indicating greater symptoms of depression. The PHQ-9 has good construct and internal validity and excellent internal and test-retest reliability (Kroenke et al., 2001). The reliability in the current sample was good (α = .80).

**Comfort on Facebook and face-to-face.**Levels of comfort on Facebook and face-to-face were measured using the Preference for Online Social Interaction Scale (POSI; Caplan, 2007). The wording of the questions was changed to ask about ‘Facebook’ rather than ‘online’, therefore this measure will be referred to as the Preference for Facebook Interaction Scale (POFI; see Appendix C for updated measure). The POFI is a 4-item measure on which participants rate their agreement with statements regarding their preference for Facebook versus face-to-face interaction (e.g. ‘I feel safer relating to other people on Facebook rather than face-to-face’) on a 5-point Likert scale, ranging from 1 (‘strongly disagree’) to 5 (‘strongly agree’). Scores for each item are totalled and scores range from 4-20, with scores between 13 and 20 indicating greater preference for interacting on Facebook, scores between 4 and 11 indicating greater preference for interacting face-to-face and a score of 12 indicating neither a preference for Facebook nor face-to-face. The POSI has been considered as a measure of comfort interacting online in previous research (Prizant-Passal et al., 2016) and each item on the POSI has been shown to measure the same underlying construct (Caplan, 2007). The POSI has previously been shown to be associated with SA (Caplan, 2007; Lee & Stapinski, 2012), loneliness (Caplan, 2007), safety behaviour use face-to-face (Lee & Stapinski, 2012), behavioural avoidance of face-to-face interactions (Lee & Stapinski, 2012) and compulsive internet use (Kim, LaRose, & Peng, 2009). The POSI has been shown to have good internal reliability (α=.80; Caplan, 2007) and the reliability in the current sample was excellent (α=.92).

**Safety behaviours.** Safety behaviour use face-to-face was measured using the Social Behaviour Questionnaire (SBQ; Clark et al., 1995; modified by McManus, Sacadura & Clark, 2008). This is a measure on which respondents rate how often they use 35 different safety behaviours during social interactions (e.g. ‘try not to attract attention’, ‘try to act normal’) on a 4-point scale, ranging from 0 (‘Never’) to 3 (‘Always’). Scores for each item are totalled and scores range from 0-105, with higher scores indicating greater safety behaviour use. The SBQ has good internal reliability (McManus et al., 2008). The reliability in the current sample was excellent (α=.92).

Safety behaviour use on Facebook was measured using the Social Media Safety Behaviour Questionnaire (SMSBQ; Ryan, Warnock-Parkes, & Clark, 2018). This is an adapted version of the SBQ which explores safety behaviours on social media. Participants rate how often they engage in 20 different safety behaviours when using Facebook (e.g. ‘avoid adding anything too personal about yourself’, ‘think about what to put on the site beforehand’) on a 4-point Likert scale, ranging from 0 (‘Never’) to 3 (‘Always’). Scores for each item are totalled and scores range from 0-60, with higher scores indicating greater safety behaviour use. The reliability in the current sample was excellent (α=.91).

**Negative cognitions.** Negative cognitions face-to-face were measured using the Social Cognitions Questionnaire (SCQ; Wells et al., 1993; modified by McManus et al., 2008). This is a measure on which respondents rate the frequency with which they experienced 22 different cognitions during recent face-to-face interactions (e.g. ‘I am unlikeable’, ‘People will not like me’) on a 5-point Likert scale, ranging from 1 (‘Thought never occurs’) to 5 (‘Thought always occurs’). Scores for each item are totalled and scores range from 22-110, with higher scores indicating more frequent negative cognitions. The SCQ has good levels of internal reliability (McManus et al., 2008). The reliability in the current sample was excellent (α=.95).

Negative cognitions during Facebook interactions were measured using the Social Media Cognitions Questionnaire (SMCQ; Ryan et al., 2018). This is an adapted version of the SCQ which explores cognitions related to social media. Participants rate the frequency with which they have experienced 23 different cognitions in the last week when using Facebook (e.g. ‘I am unlikeable’, ‘I write stupid things’), on a 5-point Likert scale, ranging from 1 (‘Thought never occurs’) to 5 (‘Thought always occurs’). Scores for each item are totalled and scores range from 23-115, with higher scores indicating more frequent negative cognitions. The reliability in the current sample was excellent (α=.95).

**Impression management.** Impression management was measured using two subscales of the Self-Presentation on Facebook Questionnaire (SPFBQ; Michikyan, Dennis, & Subrahmanyam, 2014). The original SPFBQ is a 17-item questionnaire, on which participants rate their agreement with statements on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). It measures 5 subscales: real-self, ideal-self, false-self: deception, false-self: exploration and false-self: compare/impress. However, some previous research has used only the real-self and false-self: deception subscales of the SPFBQ to measure impression management, since the remaining three subscales are hard to distinguish between and highly correlated (Ranzini & Lutz, 2017). Given the research questions in the current study, the decision was made to also use these two subscales. The real-self subscale has five items measuring participant’s presentation of their real-self on Facebook (e.g. ‘The way I present myself on Facebook is how I am in real life’). The mean score for this subscale was computed, with higher scores indicating greater real-self presentation. The reliability of this subscale in the current sample was good (α=.80). The false-self subscale has four items measuring participant’s presentation of their false-self on Facebook (e.g. ‘I am a completely different person on Facebook than I am offline’). The mean score for this subscale was computed, with higher scores indicating greater false-self presentation. The reliability of this subscale in the current sample was questionable (α=.62).

The real-self and false-self subscales of SPFBQ were also adapted to measure real and false self-presentation face-to-face. The wording of the questions was changed to ask about ‘face-to-face’ rather than Facebook. To check the factor structure of this adapted measure the nine items from these two subscales were subjected to a principal components factor analysis with varimax rotation. The factor analysis yielded 2 factors with Eigenvalues greater than 1.00 (Appendix D). Consideration was also given to the criteria set by McCroskey and Young (1979) for identifying a factor. After consideration of these criteria, a two factor solution of the data was accepted. These two factors mapped exactly onto the original real-self (‘Who I am in face-to-face interactions is similar to who I really am’; α = .88) and false-self: deception (‘I am a completely different person in face-to-face interactions than who I really am’; α = .77) subscales. The two factors that were accepted explained 68% of the variance.

**Free-text comments on comfort face-to-face and on Facebook.** Participants were presented with some free-text response questions exploring the different factors that contribute to comfort on Facebook and face-to-face. Participants were asked the following:

1. Do you generally feel more comfortable interacting with other people on Facebook or face-to-face?
2. Why is this? What factors do you think contribute to your level of comfort interacting in this setting?
3. What would make you feel more comfortable interacting in the setting which you have indicated was less comfortable for you?
4. Do you have any other comments?

Responses were extracted into a separate file for coding.

**Procedure**

Participants were given an internet link to follow and completed all questionnaires online using Qualtrics software. After being presented with the information sheet and accepting the terms of a consent statement (Appendix E), participants were presented with the PHQ-9. If not excluded at this stage, participants were then presented with the bFNES and APPQSP. Those participants who did not meet the inclusion criteria at this stage were directed to a debrief page[[2]](#footnote-2) and the survey ended. Participants who met the criteria for inclusion in the study were then presented with the POFI, followed by the face-to-face or Facebook related measures presented in a randomised order, followed by the qualitative information. At the end of the survey, participants were directed to a debrief page2.

‘**Service user’ involvement.** Once the study had been completed, 68 participants who left their email addresses for the prize draw were emailed a summary of the results of the research and were invited to give their feedback on this (see Appendix F for research summary). Four participants opted to provide feedback on the results of the research. Participant feedback was used to assist with the interpretation of the results.

**Results**

**Descriptive Statistics**

Descriptive statistics for each variable split by social anxiety (SA) group are displayed in Table 4. Where assumptions for parametric tests were met then these were used, otherwise non-parametric tests were used.

Table 4.

*Descriptive statistics for each predictor variable for the low and high social anxiety group*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Low Social Anxiety  *n=51* | High Social Anxiety  *n=43* | *p* |
| Comfort on Facebook: mean (SD) | 7.04 (3.08) | 10.79 (4.36) | <.001\*\* |
| Negative cognitions face-to-face: mean (SD) | 30.75 (9.28) | 56.63 (14.26) | <.001\*\* |
| Negative cognitions on Facebook: mean (SD) | 30.78 (8.24) | 51.80 (15.65) | <.001\*\* |
| Safety behaviours face-to-face: mean (SD) | 23.29 (10.83) | 44.44 (11.45) | <.001\*\* |
| Safety behaviours on Facebook: mean (SD) | 18.75 (9.73) | 31.60 (10.74) | <.001\*\* |
| Real-self face-to-face: mean (SD) | 4.31 (.64) | 3.41 (.81) | <.001\*\* |
| Real-self Facebook: mean (SD) | 3.64 (.97) | 3.19 (.86) | *.*022\* |
| False-self face-to-face: mean (SD) | 1.60 (.61) | 2.50 (.82) | <.001\*\* |
| False-self Facebook: mean (SD) | 1.44 (.57) | 1.90 (.63) | <.001\*\* |

\*p<.05, \*\*p <.001

**Multiple Regression Analysis**

To explore Hypotheses 1 to 4 a hierarchicalmultiple regression analysis was run with comfort on Facebook versus face-to-face (POFI) as the outcome variable. To control for potential confounders, age, gender and depression were entered as predictor variables in the first block. One participant in the high SA group had missing data for age, therefore their score was replaced with the mean age for the high SA group (Field, 2005). In the second block, SA was entered as a predictor. In the third block, those factors hypothesised to be important maintenance factors of SA in the CBT model (negative automatic thoughts face-to-face, negative automatic thoughts on Facebook, safety behaviours face-to-face and safety behaviours on Facebook) were entered as predictors, to see if these factors predicted comfort on Facebook over and above SA. In the fourth block, the impression management variables (real-self presentation face-to-face and on Facebook, false-self presentation face-to-face and on Facebook) were entered as predictors. These were entered in a separate block, since impression management is not hypothesised to be a key maintenance factor of SA and there appeared to be less evidence in previous research for the link between impression management and comfort on Facebook. Finally, in the fifth and sixth blocks the interaction between SA and each predictor variable was entered to explore whether there were differences between the high and low SA groups. Summary data for the regression analysis is displayed in Table 5, and zero-order correlations in Table 6.

Multiple regression assumptions were checked as outlined in Field (2005). The values of the Durbin-Watson test fell close to 2, suggesting independent residuals. Observation of the regression plots suggested that assumptions of homoscedasticity, linearity and normally distributed residuals were met sufficiently for the analysis to be considered reliable. Multicollinearity statistics were explored for each of the main predictors. All correlations between the main predictors fell below R < .9 (Table 6), all values of VIF for the main predictors were below 10 (range: 1.006-4.857) and tolerance above 0.1. suggesting no significant problems with multicollinearity.

The first block of the model in which age, gender and depression were added as predictors was significant and explained 13.7% of the variance in comfort interacting on Facebook versus face-to-face. Depression was significantly independently associated with comfort on Facebook, with higher depression associated with greater comfort on Facebook (B = .33, *β* = .28, *t*(90) =2.79, *p*=.006).

In the second block of the model, in which social anxiety (SA) was added as a predictor, there was a significant increase in the amount of variance explained. Adding SA to Block 2 of the model explained an additional 10.3% of the variance in comfort interacting on Facebook versus face-to-face. SA was significantly independently associated with comfort on Facebook (B = 3.19, *β* = .39, *t*(89) =3.48, *p*=.001), with those in the high SA group reporting greater comfort on Facebook over face-to-face interactions. Age, gender and depression were not independently associated with comfort on Facebook.

In the third block of the model, in which negative cognitions both face-to-face and on Facebook and safety behaviours both face-to-face and on Facebook were added as predictors there was not a significant increase in the amount of variance explained. Therefore, Hypotheses 2 and 3 were not supported, since negative cognitions and safety behaviours both face-to-face and on Facebook were not significantly associated with feelings of comfort.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 5.  *Summary of regression analysis predicting comfort interacting on Facebook versus face-to-face* | | | | | |  |
|  | *Predictor Statistics* | | | *Block Change Statistics* | |  |
|  | *Standardised β* | *t* | *p* | *Significance* | *Total*  *R2* | *Adjusted R2* |
| Block 1  Age  Gender †  Depression | -.19  -.08  .30 | -1.93  -.77  2.79 | .057  .444  .006\*\* | F(3, 90) = 4.76, p=.004\*\* | .137 | .108 |
| Block 2  Age  Gender †  Depression  Social Anxiety ‡ | -.04  -.10  .17  .39 | -.35  -1.12  1.67  3.48 | .728  .265  .099  .001\*\* | F(1, 89) = 12.08, p=.001\*\* | .240 | .206 |
| Block 3  Age  Gender †  Depression  Social Anxiety ‡  Negative cognitions face-to-face  Negative cognitions on Facebook  Safety behaviours face-to-face  Safety behaviours on Facebook | -.02  -.12  .09  .19  .23  -.11  .13  .09 | -.16  -1.23  .85  1.25  1.16  -.71  .67  .63 | .870  .221  .398  .214  .248  .480  .506  .530 | F(4,85) = 1.46, p=.221 | .289 | .222 |
| Block 4  Age  Gender †  Depression  Social Anxiety ‡  Negative cognitions face-to-face  Negative cognitions on Facebook  Safety behaviours face-to-face  Safety behaviours on Facebook  Real-self face-to-face  Real-self Facebook  False-self face-to-face  False-self Facebook | -.11  -.15  .02  .11  .19  -.19  .13  .06  -.39  .40  .09  .01 | -1.19  -1.74  .25  .80  1.01  -1.35  .74  .45  -3.12  4.30  .73  .14 | .237  .086  .807  .426  .317  .182  .462  .654  .002\*\*  <.001\*\*\*  .470  .890 | F(4, 81) = 6.59, p<.001\*\* | .464 | .384 |
| Block 5  Age  Gender †  Depression  Social Anxiety ‡  Negative cognitions face-to-face  Negative cognitions on Facebook  Safety behaviours face-to-face  Safety behaviours on Facebook  Real-self face-to-face  Real-self Facebook  False-self face-to-face  False-self Facebook  SA \* Negative cognitions face-to-face  SA \* Negative cognitions on Facebook  SA \* Safety behaviours face-to-face  SA \* Safety behaviours on Facebook | -.11  -.15  -.01  -.18  -.42  .34  -.13  -.03  -.38  .36  .09  .03  .92  -.79  .46  .07 | -1.11  -1.66  -.15  -.46  -.67  .48  -.23  -.07  -2.98  3.71  .74  .31  .94  -.78  .52  .11 | .271  .101  .885  .648  .506  .635  .821  .948  .004\*\*  <.001\*\*\*  .462  .761  .351  .438  .606  .914 | F(4,77) = .59, p=.671 | .479 | .371 |
| Block 6  Age  Gender †  Depression  Social Anxiety ‡  Negative cognitions face-to-face  Negative cognitions on Facebook  Safety behaviours face-to-face  Safety behaviours on Facebook  Real-self face-to-face  Real-self Facebook  False-self face-to-face  False-self Facebook  SA \* Negative cognitions face-to-face  SA \* Negative cognitions on Facebook  SA \* Safety behaviours face-to-face  SA \* Safety behaviours on Facebook  SA \* Real-self face-to-face  SA \* Real-self Facebook  SA \* false-self face-to-face  SA \* false-self Facebook | -.11  -.16  -.05  -.86  -1.03  .47  -.19  -.34  -.77  .05  .84  .32  1.88  -.82  .46  .48  .40  .54  -1.15  -.52 | -1.16  -1.91  -.54  -.95  -1.67  .69  -.36  -.70  -1.96  .18  2.06  .98  1.96  -.86  .55  .73  .79  1.39  -1.84  -1.08 | .249  .060  .590  .344  .099  .492  .718  .485  .054  .860  .043\*  .330  .054  .394  .583  .468  .433  .168  .070  .282 | F(4,73) = 3.58, p=.01\* | .565 | .446 |

\*p<.05, \*\*p<.01, \*\*\*p<.001

†binary predictor (0= male; 1= female)

‡binary predictor (0=low SA; 1= high SA)

Table 6.

*Multiple regression zero-order correlations table*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1. Preference for Facebook Interaction | -.243\*\* | -.051 | .309\*\* | .453\*\*\* | .484\*\*\* | .365\*\*\* | .476\*\*\* | .370\*\*\* | -.482\*\*\* | .101 | .427\*\*\* | .280\*\* |
| 2. Age |  | -.016\* | -.186\*\*\* | -.461\*\*\* | -.394\*\* | -.262\*\*\* | -.359\*\* | -.184\* | .202\* | .261\*\* | -.228\* | -.153 |
| 3. Gender |  |  | .077 | .104 | .081 | -.015 | .047 | .145 | -.046 | .083 | .022 | -.073 |
| 4.Depression |  |  |  | .374\*\*\* | .470\*\*\* | .332\*\* | .417\*\*\* | .336\*\*\* | -.310\*\* | -.034 | .336\*\*\* | .125 |
| 5. SA |  |  |  |  | .741\*\*\* | .655\*\*\* | .692\*\*\* | .536\*\*\* | -.532\*\*\* | -.236\* | .536\*\*\* | .365\*\*\* |
| 6. Negative cognitions face-to-face |  |  |  |  |  | .747\*\*\* | .812\*\*\* | .588\*\*\* | -.608\*\*\* | -.296\*\* | .609\*\*\* | .398\*\*\* |
| 7. Negative cognitions on Facebook |  |  |  |  |  |  | .675\*\*\* | .627\*\*\* | -.561\*\*\* | -.227\* | .525\*\*\* | .431\*\*\* |
| 8. Safety behaviours face-to-face |  |  |  |  |  |  |  | .738\*\*\* | -.521\*\*\* | -.237\* | .552\*\*\* | .437\*\*\* |
| 9. Safety behaviours on Facebook |  |  |  |  |  |  |  |  | -.401\*\*\* | -.104 | .417\*\*\* | .523\*\*\* |
| 10. Real-self face-to-face |  |  |  |  |  |  |  |  |  | .377\*\*\* | -.687\*\*\* | -.368\*\*\* |
| 11. Real-self Facebook |  |  |  |  |  |  |  |  |  |  | -.332\*\* | -.172\* |
| 12. False-self face-to-face |  |  |  |  |  |  |  |  |  |  |  | .451\*\*\* |
| 13. False-self Fbook |  |  |  |  |  |  |  |  |  |  |  |  |

\*p<.05, \*\*p<.01, \*\*\*p<.001

In the fourth block of the model, in which the impression management variables were added as predictors, there was a significant increase in the amount of variance explained. Including these predictors at Block 4 allowed 46.4% of the variance in comfort interacting on Facebook versus face-to-face to be accounted for. In this block, SA was not a significant predictor of comfort on Facebook. Therefore, Hypothesis 1 was only partially supported. Real-self presentation face-to-face was significantly independently associated with comfort on Facebook, with a reduction in real-self presentation face-to-face associated with an increase in comfort on Facebook versus face-to-face (B = -1.89, *β* = -.39, *t*(81) = -3.12, *p*=.002). Real-self presentation on Facebook was also significantly independently associated with comfort on Facebook, with an increase in real-self presentation on Facebook associated with an increase in comfort on Facebook versus face-to-face (B = 1.74, *β* = .40, *t*(81) = 4.30, *p*<.001).

The fifth block of the model, in which the interaction terms between SA and negative cognitions and safety behaviours both online and face-to-face were entered did not significantly increase the amount of variance explained.

The sixth and final block of the model, in which the interaction terms between SA and real-self presentation and SA and false-self presentation both on Facebook and face-to-face were entered significantly increased the amount of variance explained. All of the variables included in the final block of the model explained 56.5% of the variance in comfort interacting on Facebook versus face-to-face. This Block was significantly better than chance (adjusted R2 = .446; *F*(20, 73) = 4.74, *p*<.001). False-self presentation face-to-face was significantly independently associated with comfort on Facebook, with an increase in false-self presentation face-to-face associated with an increase in comfort on Facebook versus face-to-face (B =4.14, *β* = .84, *t*(73) = 2.06, *p*=.043). Real-self presentation face-to-face approached significance and was negatively associated with comfort on Facebook, with an increase in real-self presentation face-to-face associated with a decrease in comfort on Facebook versus face-to-face (B = -3.77, *β* = -0.77, *t*(81) = -1.96, *p*=.054). The Facebook impression management variables were not significantly independently associated with feelings of comfort on Facebook. Therefore, Hypothesis 4 was not supported. Although using impression management strategies face-to-face (i.e. presenting a false-self) was associated with comfort face-to-face, this was associated with a reduction in feelings of comfort face-to-face rather than an increase as predicted. Not using impression management strategies (i.e. presenting one’s real-self) was associated with an increase in feelings of comfort. In the sixth and final Block of the model, none of the interactions were statistically significant, suggesting that there were no significant differences between the high and low SA groups.

**Qualitative Analysis**

Participants free-text comments were analysed using thematic analysis, following the guidelines outlined by Braun and Clarke (2006). Responses were reviewed by the researcher and initial codes identifying interesting features of the data were noted. These codes were then sorted into potential themes, using the definition of a theme as a pattern of responses or meaning within the data set related to the research question (Braun & Clark, 2006). Once potential themes had been identified, the data was again reviewed in relation to links or overlap between the themes and at this stage some themes were collated for greater clarity. This process identified two main themes and nine sub-themes organising the data. Please see Table 8 for information on main themes and sub-themes. Participant quotes and thematic map are available in Appendix H.

In the free-text responses, participants with high SA were more likely than those with low SA to endorse feeling more comfortable on Facebook rather than face-to-face (*χ*2(1) = 12.02, *p*=.001).

**Factors contributing to greater feelings of comfort face-to-face**. Those participants who reported feeling more comfortable interacting face-to-face identified six factors which contributed to their feelings of comfort face-to-face. Both participants with high and low SA identified that they value the presence of face-to-face cues for communication, information is less likely to be misinterpreted face-to-face, Facebook is “fake”, face-to-face communication is less permanent than Facebook communication and face-to-face communication feels more genuine than Facebook. In addition, high SA participants identified that face-to-face communication is more private than Facebook. This did not emerge as a theme for low SA participants.

**Factors contributing to greater feelings of comfort on Facebook**. Those participants who reported feeling more comfortable interacting on Facebook identified three factors which contributed to their feelings of comfort on Facebook. Both participants with low and high SA identified that on Facebook you do not have to respond immediately and can plan what to say, and you can avoid being seen, awkwardness and making mistakes. Those participants with low SA also identified being able to use Facebook to widen or maintain social networks. This did not emerge as a theme for high SA participants.

Table 7.

*Factors contributing to greater feelings of comfort face-to-face and on Facebook and number of high and low SA participants who endorsed each factor*

|  |  |  |
| --- | --- | --- |
|  | Low  *n=51* | High  *n=43* |
| More comfortable face-to-face: n (%) | 43 (84) | 22 (51) |
| **Factors contributing to greater comfort face-to-face** |  |  |
| *Face-to-face cues for communication* | 22 | 11 |
| *Information less likely to be misinterpreted face-to-face* | 7 | 3 |
| *Facebook is “fake”* | 4 | 3 |
| *Face-to-face communication less permanent than Facebook* | 2 | 2 |
| *Face-to-face communication more private than Facebook* | 0 | 4 |
| *Face-to-face communication is more genuine* | 2 | 2 |
| More comfortable on Facebook: n (%) | 8  (16) | 21 (49) |
| **Factors contributing to greater comfort on Facebook** |  |  |
| *You do not have to respond immediately and can plan what*  *to say* | 1 | 11 |
| *Avoidance of being seen, awkwardness and making mistakes* | 2 | 10 |
| *You can widen/maintain social networks* | 3 | 0 |

**Discussion**

Based on the findings of previous research, it was hypothesised that social anxiety (SA) would be associated with comfort interacting on Facebook, and that compared to those with low SA, individuals with high SA would report greater feelings of comfort on Facebook versus face-to-face. The results from both the qualitative data and multiple regression analysis initially supported this hypothesis. However, when safety behaviours, negative cognitions and impression management were considered, the association between SA and comfort on Facebook became non-significant. Therefore, Hypothesis 1 was only partially supported. Furthermore, the mean score on the POFI for participants with high SA was still within the range suggesting that they generally felt more comfortable interacting face-to-face.

These findings are in contrast to those of previous research, the majority of which has found that those with high SA feel more comfortable interacting online than face-to-face (Caplan, 2007; Erwin et al., 2004; Martončik & Lokša, 2016; Pierce, 2009; Shepherd & Edelmann, 2005; Weidman et al., 2012; Yen et al., 2012). The current study differs from previous research since it explored comfort on Facebook, rather than in other online settings such as chat or messaging. Differences between Facebook and other online settings may contribute to individuals with SA feeling less comfortable on Facebook than in other online environments. This is partially supported by the disadvantages of Facebook identified by participants in the qualitative data, for example, that Facebook is “fake” and less private than face-to-face communication. It is possible that these factors may explain why participants with SA generally felt more comfortable communicating face-to-face. Future research could explore whether individuals with SA feel less comfortable on Facebook compared to other online environments.

In spite of the above, the current research did find an association between SA and comfort on Facebook until behaviours, cognitions and impression management were considered. The majority of previous research on SA and comfort online has not included other possible variables that may explain the variability in feelings of comfort online. This is a significant weakness of research in the area. This may explain the contrasting results found in the current research, since thoughts, behaviours and impression management may be more important than SA in explaining comfort on Facebook.

This research also aimed to explore whether safety behaviours, negative cognitions and impression management were significantly associated with comfort interacting on Facebook and face-to-face, and whether these relationships differed depending on level of SA. It was predicted that in both Facebook and face-to-face settings, increased negative cognitions would be associated with a reduction in feelings of comfort (Hypothesis 2), increased safety behaviour use would be associated with an increase in feelings of comfort (Hypothesis 3) and increased use of impression management strategies would be associated with increased feelings of comfort (Hypothesis 4).

Hypothesis 2 and 3 were not supported, since negative cognitions and safety behaviours both face-to-face and on Facebook were not significantly independently associated with feelings of comfort. However, in the final regression model, the combination of these factors along with SA and the control variables explained a large amount of the variance in comfort interacting on Facebook versus face-to-face. Negative cognitions and safety behaviours are thought to be important maintenance factors of SA (Clark & Wells, 1995). It may be that because these variables are so entwined with SA they do not significantly explain more variance in comfort on Facebook over and above feelings of SA.

It is also possible that negative cognitions and safety behaviours might mediate the relationship between SA and comfort on Facebook. The cognitive model of SA suggests that negative cognitions increase feelings of anxiety and that safety behaviours temporarily reduce feelings of anxiety (Clark, 2001). It may be that the association between SA and comfort on Facebook is mediated via decreased negative cognitions and increased safety behaviours. Since negative cognitions and safety behaviours are so entwined with SA, including these variables as separate predictors in the regression model may have reduced the level of variance attributable to SA. The impact of exploring these variables as mediators of the relationship between SA and comfort on Facebook could be explored in future research.

In terms of Hypothesis 4, it was predicted that in both Facebook and face-to-face settings increased use of impression management strategies would be associated with increased feelings of comfort. The findings suggested that presentation of one’s false-self face-to-face was significantly positively associated with an increase in comfort on Facebook and a reduction in comfort face-to-face. There was also a trend for presentation of one’s real-self face-to-face to be associated with a reduction in comfort on Facebook and an increase in comfort face-to-face. This suggests that those who engage in impression management strategies face-to-face (i.e. present their false-self) tend to feel less comfortable face-to-face and more comfortable on Facebook, and that those who engage in fewer impression management strategies face-to-face (i.e. present their real self) tend to feel more comfortable face-to-face and less comfortable on Facebook. Therefore, Hypothesis 4 was not supported.

It may be that those who prefer to manage the impression they present face-to-face turn to Facebook because it is a setting in which they can more easily do this (Casale et al., 2015; Michikyan et al., 2014; Zywica & Danowski, 2008). For example, those who find it harder to present their real-self face-to-face may feel more comfortable on Facebook, since they have more control over self-presentation. This idea is partially supported by the qualitative results, in which being able to avoid awkwardness and making mistakes emerged as a factor contributing to comfort on Facebook. However, the cross-sectional nature of this research makes this difficult to determine, as it could also be the case that feeling less comfortable face-to-face increases use of impression management strategies and encourages people to present a false-self. Previous research has also identified that those with high SA are more likely to present their ideal-self on Facebook compared to those with low SA (Bodroža and Jovanović, 2016), therefore future research could also explore the associations between ideal-self presentation and feelings of comfort on Facebook.

The final research question explored the other factors that those with high and low SA thought contributed to their levels of comfort on Facebook and face-to-face. Participants who were more comfortable on Facebook valued not having to respond immediately, being able to plan what to say and avoidance of being seen, awkwardness and making mistakes.These results broadly fit with those of previous research suggesting that the absence of non-verbal cues and temporal flexibility of online interactions contribute to comfort (Prizant-Passal et al., 2016). The results also suggested that participants with low SA valued being able to maintain and widen their social networks on Facebook, but this was not the case for those with high SA. This fits with previous research suggesting that those with low SA may use Facebook more socially than those with high SA (Shaw et al., 2015).

**Summary of Findings**

In summary, the findings of this research suggested that individuals with high SA felt less comfortable communicating face-to-face and more comfortable on Facebook compared to those with low SA. However, when behaviours, thoughts and impression management were considered this association disappeared. Furthermore, the scores of high SA participants suggested that they generally felt more comfortable communicating face-to-face than on Facebook, perhaps due to negative aspects of Facebook communication, for example that it is ‘fake’. The combination of SA, safety behaviours, negative cognitions and impression management explained a large amount of variance in comfort interacting on Facebook versus face-to-face, although safety behaviours and negative cognitions were not significantly independently associated with comfort on Facebook. The results suggested that those who presented their false-self face-to-face tended to feel less comfortable face-to-face and more comfortable on Facebook. There was also a trend for those who felt less able to express their real-self face-to-face to feel less comfortable face-to-face and more comfortable on Facebook.

**Limitations**

The current research has a number of limitations which limit the conclusions that can be drawn. The cross-sectional design means that the direction of causality between the predictor variables and comfort interacting on Facebook cannot be determined. For example, from the current results it is difficult to determine whether self-presentation in a particular setting leads to increased feelings of comfort, or whether feelings of comfort lead someone to alter the aspects of themselves that they present. Future, longitudinal research could explore the factors that contribute to comfort on Facebook for those with SA over time, which would allow understanding of which factors influence feelings of comfort longitudinally.

Most of the measures used were well-known and had good reliability and validity, however the internal consistency of the false-self presentation on Facebook measure was questionable. Therefore, this variable may not have been accurately measured. Furthermore, a version of the Preference for Online Interaction Scale (POFI) was used which was updated to explore comfort on Facebook. Although this measure has been used previously as a measure of comfort levels when interacting online (Prizant-Passal et al., 2016), the measure aims to explore preference for interacting online, rather than comfort per se. Therefore, the construct validity of this measure in relation to the research questions is unclear. It is possible that some participants may feel more comfortable on Facebook but still prefer to communicate face-to-face. In addition, it is difficult to determine from the POFI whether an increase in scores reflects a decrease in feelings of comfort face-to-face or an increase in feelings of comfort on Facebook. This made interpreting some of the findings difficult.

The POFI is currently the only tool which is widely used to measure comfort on Facebook, however future research may benefit from the development and use of a more precise measure of feelings of comfort on Facebook. Within the current study it would have been preferable to have used two separate measures of comfort interacting on Facebook and face-to-face, which would have allowed for two separate multiple regression analyses to have been conducted; one exploring the face-to-face variables and the other the Facebook variables.

In terms of the sample used, a non-clinical sample was chosen as there are likely to be high levels of undiagnosed SA in non-clinical populations (Stein & Stein, 2008) and it was thought that recruitment of a large clinical sample would not be feasible within the timescale of this thesis. However, it is possible that different results may have been found had these associations been investigated in a clinical sample of individuals diagnosed with social anxiety disorder (SAD). Furthermore, the sample was comprised of students and the Facebook connections of the researcher, and were mostly of White ethnicity, female and fairly young. Therefore, this sample is unlikely to be representative of the broader demographic of people who use Facebook.

With regards to the sample size, a power analysis was conducted, which suggested that a sufficient number of participants had been recruited to detect improvements in the regression model. However, to explore which individual predictors are significant in multiple regression analyses it is generally recommended that 10-15 participants are recruited per predictor variable in order to obtain a reliable model (Babyak, 2004; Field, 2005). In the current research, the final block of the regression model included 20 predictors, thus the recommended sample size would be between 200-300 participants. The final sample size recruited was significantly smaller than this recommendation, which raises the possibility that the analysis involved overfitting of the regression model, meaning that the findings are unique to the sample selected and are highly unlikely to be replicated within the wider population (Babyak, 2004). Therefore, the findings of this research should be interpreted cautiously, since it is unclear whether they can be generalised outside of the sample recruited.

Finally, processing of the self as a social object is a further key feature of SA suggested by the CBT model (Clark, 2001), yet this was not explored in the current research as a potential factor contributing to feelings of comfort on Facebook. Processing of the self as a social object refers to the propensity of those with SA to shift their attention to detailed monitoring and self-observation when in anxiety provoking social situations as a means of assessing how they appear to others. This self-generated information is likely to be biased, but is used by people with SA as evidence for their negative beliefs about how they are coming across, thus increases anxiety (Clark, 2001). Facebook is a setting in which people can easily monitor how they are coming across to others, for example in terms of checking ‘likes’ or comments received. It is possible that increased processing of the self as a social object on Facebook may lead to a reduction in feelings of comfort on Facebook. This could be explored in future research.

**Implications**

In spite of the limitations,this research is the first to suggest that a combination of the factors related to the CBT model for SA are important in explaining levels of comfort on Facebook, both for those with and without SA. This may have implications for previous research which has suggested that SA contributes to comfort interacting online. It may be more important to consider cognitions, behaviours and particularly impression management when considering why people feel more comfortable communicating online or face-to-face.

These findings may also have implications for the treatment of those with SA. Social interactions are increasingly taking place on social media (Baker & Jeske, 2015; Eraslan-Capan, 2015), therefore clinicians working with those with SA may wish to consider Facebook interactions in therapy. Since negative cognitions, safety behaviours and impression management are thought to maintain SA (Clark, 2001; Clark & Wells, 1995), consideration could be given to how these variables may also interact to maintain SA during online communication. Furthermore, it has previously been suggested that internet-based therapy may be preferred by people with SA as they prefer communicating online (Tillfors et al., 2008). However, the results of the current research suggest that this may not always be the case.

For those with SA who feel more comfortable communicating on Facebook, Facebook interactions could also be considered in the development of fear hierarchies and cognitive exposure exercises (Erwin et al., 2004). People with SA may feel more comfortable exposing themselves to feared social situations on Facebook initially, before moving on to face-to-face exposure. Therapists should ensure regular exposure to face-to-face interactions to provide corrective learning experiences and reduce avoidance (Lee & Stapinski, 2012).

Furthermore, the results of the current research suggested that there were clear individual differences in terms of preference for Facebook or face-to-face communication and 51% of high SA participants reported that they felt more comfortable face-to-face. It is important to consider individual differences in what drives people to prefer online interaction. There is a large amount of variability within SAD in terms of the types of social situations that are feared and the range of feared outcomes (National Collaborating Centre for Mental Health, 2013). It may be that this variability contributes to differences in preference for Facebook or face-to-face interaction. This could be explored in future research.

**Conclusion**

In conclusion, the findings of the current research suggested that SA is associated with comfort interacting on Facebook, although this association became non-significant when behaviours, thoughts and impression management were considered. The combination of SA, safety behaviours, negative cognitions and impression management explained a large amount of variance in comfort interacting on Facebook versus face-to-face, although only false-self presentation face-to-face was a significant individual predictor of comfort on Facebook. Since social interactions are increasingly taking place on social media, clinicians may wish to consider Facebook interactions in therapy. There were a number of limitations to this research, for example the cross-sectional design and non-representative sample. Further, longitudinal research is required before firm conclusions can be drawn about the factors that contribute to feelings of comfort on Facebook for those with SA.

**Integration, Impact and Dissemination**

**Integration**

The overall aim of this thesis was to explore the relationships between feelings of social anxiety (SA) and Facebook use. The systematic review explored the potential benefits and disadvantages of using Facebook for people with SA, whilst the empirical study explored the factors that contribute to feelings of comfort interacting on Facebook in these individuals.

The process of integrating the empirical study with the systematic review was unusual for this thesis, since the requirement to complete the systematic review was added once the empirical study had already been designed. Therefore, the systematic review was not able to form the conceptual basis for the design of the empirical research. However, there was broad overlap in terms of the themes explored. The empirical study explored a potential benefit of Facebook use for people with SA, in terms of feelings of comfort. The systematic review was able to explore this topic more broadly, looking at the full range of benefits and disadvantages of Facebook use for those with SA.

The results of the empirical study suggested that although individuals with high SA felt more comfortable on Facebook than those with low SA, overall both those with high and low SA felt more comfortable in face-to-face interactions. Thus the findings of the empirical study suggested that increased feelings of comfort on Facebook compared to face-to-face may not be a benefit of using Facebook for all individuals with SA. However, it should be noted that a non-clinical sample was used and it is possible that those with more severe and impairing SA may in fact feel more comfortable on Facebook than they do face-to-face. This could be explored in future research.

The systematic review identified a potential benefit of Facebook use for people with SA in terms of the reduced cues and increased controllability of Facebook, which it is thought may contribute to a reduction in feelings of anxiety on Facebook compared to face-to-face (Caplan, 2007; Indian & Grieve, 2014; Valkenburg, Schouten, & Peter, 2005; Zywica & Danowski, 2008). This finding was supported by the results of the empirical study in which some participants with high SA identified factors linked to the reduced cues and controllability of Facebook (e.g. not having to respond immediately, being able to plan what to say and avoid being seen, awkwardness and making mistakes) as factors which contributed to them feeling more comfortable interacting on Facebook rather than face-to-face. This increase in feelings of comfort on Facebook is likely to be associated with a reduction in anxiety, thus these findings potentially support the hypothesis that for people with SA, the reduced cues and increased controllability of Facebook may contribute to a reduction in feelings of anxiety.

However, not all participants with high SA in the empirical study reported valuing the reduced cues and controllability of Facebook. In fact, some participants reported that the presence of face-to-face cues in face-to-face settings actually made them feel more comfortable interacting face-to-face rather than on Facebook. Thus, whilst the reduced cues and controllability of Facebook may be a factor which contributes to some individuals with SA feeling more comfortable on Facebook, the findings of the empirical study suggested that this may not be a benefit of Facebook use for all individuals with SA. Furthermore, socially anxious participants in the empirical study identified some disadvantages of Facebook use which did not emerge from the systematic review, for example that it is ‘fake’, more permanent than face-to-face communication and less private than face-to-face. These were factors which contributed to these participants feeling more comfortable communicating face-to-face rather than on Facebook.

Therefore, although the empirical study and systematic review explored different aspects of Facebook communication and SA, the empirical study to some extent built on the topics explored in the systematic review by generating further evidence of some of the benefits and disadvantages of Facebook use for people with SA. In addition, I appreciated the fact that the empirical study and systematic review explored different aspects of Facebook communication and SA, since this was useful in allowing me to develop a broader understanding of this area. Not only was I able to develop knowledge and awareness of the benefits and disadvantages of Facebook use for individuals with SA, but was also able to consider how factors related to the cognitive-behavioural model of SA might be linked with communication on Facebook.

Having never conducted a systematic review previously, I found this a challenging component of the thesis. However, I am pleased to have been able to develop my skills in this area and would feel much more confident conducting a systematic review in future. I found the process of conducting the systematic review extremely useful to review and synthesise research in the area. The systematic review also helped me to identify research gaps in the area and potential future research. Thinking back to when I was designing the empirical study, SA and Facebook use was a completely new area to me and I therefore found it difficult to identify a question to explore. On reflection, I wished the development of the empirical study had followed the systematic review, as this would have generated a number of potential avenues for the empirical study to investigate. Now that I have the skills required to conduct a systematic review, I will certainly consider the benefits of this in future when designing research.

When considering this thesis topic within a broader context, it seemed to integrate well with recent changing attitudes towards Facebook within society. Whilst I was conducting this thesis there was significant media coverage of a large longitudinal study suggesting that Facebook use is associated with reduced well-being (Shakya & Christakis, 2017). In addition, Facebook received criticism from its founding president about its negative impact on changing our relationships with society and with each other (Solon, 2017). Representatives for Facebook also acknowledged that using their site could be bad for mental health, particularly for those who spend time on Facebook passively consuming information (Levin, 2017). In response to this criticism, Facebook announced changes to their news-feed to reduce public content (e.g. posts from businesses, brands and media) in an effort to increase social Facebook use (Zuckerberg, 2018).

The media coverage of the disadvantages of Facebook use linked well with my systematic review question and led me think about the different ways in which people can use Facebook. Facebook can be used in a social way, to interact and build relationships with others, or in a more passive way, to consume information without actively socialising. Passive Facebook use seems to be clearly associated with a negative impact (Burke, Kraut, & Marlow, 2011; Burke, Marlow, & Lento, 2010), yet research has suggested that those with SA tend to use Facebook more passively (Shaw, Timpano, Tran, & Joorman, 2015). I was pleased that the negative impacts of Facebook use had been recognised on a wider stage and hoped that the media coverage of the disadvantages of Facebook use would encourage those who use Facebook to either increase their social Facebook use or else reduce their use of Facebook altogether.

**Impact**

**Personal impact.** Whilst writing this thesis I noticed an impact on my own social media use. Consideration of the benefits and disadvantages of Facebook use led me to begin to consider my own social media use and what the disadvantages of this might be. I decided to give up social media for a month, and noticed a positive impact of this in terms of my ability to be mindful and not be distracted from everyday life by using social media. I have since greatly reduced my use of social media and plan to maintain this reduction going forward.

**Professional impact**. There was also an impact of conducting this thesis on my clinical practice. I worked with some clients during the course of clinical training with whom I actively made an effort to consider the benefits and disadvantages of their social media use. One client identified an impact of using Twitter on increasing feelings of paranoia and another wanted to reduce Facebook use in order to spend more time engaging with other aspects of life. Therefore, part of our work together in therapy focussed on trying to reduce social media use. Exploring the impact of social media use within therapy was not necessarily something that I would have considered a need for had I not have been writing this thesis and become more aware of the disadvantages of using social media. Since social media use is ubiquitous in society, I will continue to consider social media use and the impact of this in my therapy work going forward. I will regularly monitor my future practice to ascertain whether this impact has been maintained.

I have also been aware of an impact of completing this thesis on my practice as a researcher. At the start of the clinical psychology doctorate I hoped to complete a research project that would allow me to develop the necessary confidence and skills to function autonomously as a researcher in future clinical practice. Prior to clinical training, I had fairly limited research experience, and had not worked in a research setting previously. I had no experience with qualitative methodology and had never conducted a systematic review. I therefore found the process of designing and undertaking a research project and conducting a systematic review challenging. I found research supervision invaluable in this regard, along with written guidance and books. Conducting this thesis has been a steep learning curve but is a journey I am glad to have been on. I now feel much more confident in being able to review and critically appraise and also design and carry out research.

Although I do not plan to work in a specific research setting, I hope to be able to maintain my research interest and skills in my future clinical work. Having worked in the NHS for many years, I know that it can be a challenge for clinical psychologists to maintain their research practice due to the pressures of clinical work. However, the scientist-practitioner model suggests a need to be involved in both research and clinical practice post-qualification (Overholser, 2015). Paxton (2006) has discussed ways in which clinical psychologists working within the NHS can continue to be involved in research, for example being aware of ongoing research within local trusts, linking with existing local research collaborations or networks and considering small-scale research within local services, for example routine collection of clinical outcomes data (Paxton, 2006). The scientist-practitioner role can also involve using research to inform clinical practice (Overholser, 2015). I have certainly developed my skills in being able to critically appraise and review existing research evidence and would feel confident being involved in research in my future clinical practice. The ongoing impact of this thesis on my practice as a researcher will be measured through my own self-monitoring and regular professional development reviews.

**Impact on study participants.** In the free-text qualitative response boxes,three study participants spontaneously commented on how taking part in the research had impacted on them. All three seemed to have found taking part in the research interesting and thought-provoking and acknowledged that it had made them think more about their own or other people’s social media use and the effects of this:

* “*Very interesting survey. Again it's a worry how social media affects the upcoming generation and future generations*” (Participant 13, low SA)
* *“It has been a real eye-opener to how social media can rule people's lives and how some hide behind social media, comparing themselves to others, which is not healthy*” (Participant 42, low SA)
* “*This survey was very interesting. Very relevant and current. Very easy to complete physically - but mentally challenging and thought provoking - it has encouraged me to really analyse why I even use Facebook*” (Participant 45, high SA)

Therefore, it appears as though for some participants there was a personal impact of completing the research, in that it made them think more about their own and other people’s social media use.

**Broader clinical impact.** There were some changes to the proposed systematic review topic over the course of completing it and I have wondered if the final systematic review question is as relevant clinically as the questions I had previously considered. I had initially aimed to explore whether internet-delivered CBT is as effective as live CBT at reducing the symptoms of SAD, although I then had to change this topic when I discovered a recent systematic review which had already answered this question. Therefore, I identified a second potential systematic review question exploring the benefits and disadvantages of online interactions for people with SA. I thought that this would provide information relevant for considering the benefits and disadvantages of internet-delivered treatment for SAD and would also provide important information for clinicians working with people with SA who use the internet. However, when I began to conduct the review for this question, there were an extremely large number of studies which were considered suitable for inclusion in the review. Therefore, given the time frame and workload it was decided along with my supervisor that it would be prudent to focus the question on one specific area of online interactions. Since the empirical study intended to explore Facebook use it made sense to narrow the systematic review question to explore the benefits and disadvantages of Facebook use for people with SA.

Narrowing the question to look at Facebook use rather than online interactions more generally has meant that the findings do not link directly with informing internet-delivered treatment for SAD. However, since Facebook interactions are so widespread in society (Facebook, 2018), it may be an important area for clinicians to consider in their work with people with SA. I hope that once this work is published, it will have an impact on clinicians working with people who use Facebook.

Clinicians may wish to consider incorporating both the benefits and disadvantages of Facebook use into their work with those with SA. In turn, discussion around Facebook interactions in therapy would have an impact on people with SA. Using Facebook in a way in which the benefits can be optimised and the disadvantages reduced will likely be beneficial for people with SA. For example, encouraging social use of Facebook may help people with SA to meet some of their social needs on Facebook. Since some people with SA may feel more comfortable on Facebook, Facebook interactions could be considered in the development of fear hierarchies and exposure exercises (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004; Yen et al., 2012) as these may initially be more acceptable and less anxiety provoking than face-to-face interactions for people with severe SA.

It would also be important for clinicians to promote awareness of the potential disadvantages of Facebook use for people with SA. Clinicians could consider how Facebook may be used as a safety behaviour through which face-to-face social interactions can be avoided, which inadvertently maintains SA (Lee & Stapinski, 2012). Clinicians may wish to support people with SA in trying to reduce their use of Facebook and increase engagement in face-to-face interactions. The aim of this would be to reduce feelings of SA in the long term.

Consideration of social media use with clients with other mental health diagnoses may also be beneficial. There are likely to also be benefits and disadvantages of Facebook use for Facebook users who do not have significant SA (Shakya & Christakis, 2017). As found in my own clinical experience, when social media use is explored within therapy, people often identify relevant therapy goals related to their own social media use.

**Impact on future research.** Both the systematic review and empirical study have contributed to advancing research in the area. The systematic review was the first in the area to review and synthesise research exploring the potential benefits and disadvantages of Facebook use for people with SA. The empirical study was the first in the area to explore feelings of comfort on Facebook compared to face-to-face for those with SA, and the role of cognitions, behaviours and impression management in contributing to feelings of comfort. The majority of previous research into SA and feelings of comfort online had not controlled for potential confounding variables, and the empirical study suggested that SA is not significantly associated with comfort interacting online when thoughts, behaviours and impression management are considered.

The systematic review and empirical study also identified important areas for future research in relation to Facebook use and SA. The majority of research in this area has been cross-sectional, which makes it difficult to determine the direction of causality between variables. There is a need for longitudinal research exploring the benefits and disadvantages of Facebook use for people with SA and the factors that contribute to feelings of comfort on Facebook over time. Furthermore, there is a need for research exploring these associations in clinical samples of individuals diagnosed with SAD. Future research could also explore whether individuals with SA feel less comfortable on Facebook compared to other online settings and whether ideal-self presentation contributes to feelings of comfort on Facebook.

Exploring the potential benefits and disadvantages of online interactions more generally for those with SA is also an important question for future research, since this could contribute to discussions around the benefits and disadvantages of delivering CBT for SAD via the internet (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). The National Institute for Health and Care Excellent (NICE; 2013) guidelines do not currently recommend internet-delivered CBT for the treatment of SAD. However, NICE have previously recommended internet-delivered CBT for depression, panic and phobias (Kaltenthaler et al., 2006). Consideration of the benefits and disadvantages of internet use for people with SA could contribute to future considerations of whether internet-delivered CBT should also be recommended for people with SA.

One key issue that arose from this research was a potential ethical issue around the administration of the PHQ-9 online. This meant that suicidality was assessed but was then only able to be addressed through an online debrief. Given that participation was anonymous, a specific online debrief was designed for those who reported suicidality to ensure that they were given comprehensive advice about where to seek support. However, this is clearly an emotive area and for some participants the online debrief may not have provided sufficient levels of immediate emotional support. Although this research was approved by the Royal Holloway Research Ethics Committee, this does raise potential ethical considerations. As an alternative, future online research should use the PHQ-8 to assess depression (Kroenke et al., 2009), as this does not require participants to disclose their level of suicidality.

**Dissemination.**

The empirical study was disseminated via a presentation to the three clinical psychology training cohorts at Royal Holloway. I also disseminated a summary of the results of the research to participants. Participants were invited to give feedback on the results of the research and their feedback was invaluable in gaining new insights into how to interpret the findings, shaping some of the discussion points for the empirical article and considering potential areas for future research. I had initially intended to involve a group of people diagnosed with SAD in the design and dissemination of the research. Unfortunately, it proved difficult to find a service user group who were willing to be involved. However, future research should involve people with SAD in the design and undertaking of research, since service user involvement is helpful in terms of providing different perspectives to researchers, improving research quality, and making research more relevant to the populations under study (Hayes, Buckland, & Tarpey, 2012).

There is a plan to submit both the systematic review and empirical study to a journal for publication. Most research in the area of Facebook use and SA tends to be published in journals related to technology use and behaviour, therefore the systematic review and empirical study will be submitted to the journal Computers in Human Behaviour. This is a popular journal in the area, has an SJR rank of 1.595 and is within quartile 1 in terms of SJR ranks within psychology, suggesting good scientific influence.

I am also considering writing a piece for clinical psychology forum, which is the official monthly publication of the Division of Clinical Psychology of the British Psychological Society. This would focus on a discussion of Facebook use in people with SA and the benefits and disadvantages of this. The aim would be to encourage clinicians to consider social media use within therapy and to consider the benefits and disadvantages of social media use with their clients.

**Summary and Final Conclusions.**

In conclusion, this thesis explored the relationships between feelings of SA and Facebook use. The systematic review explored the benefits and disadvantages of Facebook use for people with SA and the empirical study explored the factors that contribute to feelings of comfort on Facebook for those with SA. This thesis topic seemed to integrate well with recent media coverage of the disadvantages of Facebook use and changing attitudes towards Facebook within society.

In terms of the impact of the thesis, there were impacts on myself both personally and in my practice as a clinician and researcher. There was an impact of completing the research on some study participants, in that it made them think more about their own and other people’s social media use. This thesis may also have broader clinical and research impacts, in terms of encouraging clinicians to consider Facebook use in their work with individuals with SA and identifying areas where future research is required. Longitudinal research and research with individuals diagnosed with SAD is needed, as well as research exploring the potential benefits and disadvantages of online interactions more generally for those with SA. This could contribute to discussions around the benefits and disadvantages of delivering CBT for SAD via the internet.

The results of the research were disseminated to participants and to clinical psychology trainees at Royal Holloway. There is also a plan to submit the systematic review and empirical study to a journal for publication, and to write a piece for Clinical Psychology Forum. Since Facebook use is so widespread in society it is important that clinicians are aware of the significant relationships between SA and Facebook use.

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**Appendices**

**Appendix A: Methodological quality assessment tool.**

Adapted methodological quality assessment tool based on criteria for evaluating cross-sectional analytic studies from the Mixed Methods Appraisal Tool (Pluye et al., 2011) and ratings based on those used in the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies (Thomas et al., 2004).

|  |  |
| --- | --- |
| **Methodological Quality Criteria** | **Rating** |
| **SELECTION BIAS**  *Are participants recruited in a way that minimises selection bias?*  *Consider whether the sample is representative of the population* | **Strong**: The selected individuals are very likely to be representative of the target population (e.g. consecutive or random sampling used) **and** there is greater than 80% participation.  **Medium**: The selected individuals are at least somewhat likely to be representative of the target population **and** there is 60-79% participation.  **Weak**: The selected individuals are not likely to be representative of the target population **or** there is less than 60% participation **or** selection is not described, and the level of participation is not described. |
| **DATA COLLECTION METHODS**  *Are measurements appropriate (clear origin, or validity known, or standard instruments; and absence of contamination between groups when appropriate) regarding the exposure/intervention and outcomes?*  *Consider whether (a) the variables are clearly defined and accurately measured; (b) the measurements are justified and appropriate for answering the research question; and (c) the measurements reflect what they are supposed to measure.*  *For non-randomized controlled trials, the intervention is assigned by researchers, and so consider whether there was absence/presence of a contamination. E.g., the control group may be indirectly exposed to the intervention through family or community relationships.* | **Strong**: The data collection tools have been shown to be valid (e.g. clear origin, or validity known, or standard instrument) **and** reliable (Cronbach’s alpha reported at a .7 or above; Field, 2005)  **Medium**: The data collection tools have been shown to be valid **and** the data collection tools have not been shown to be reliable **or** reliability is not described  **Weak**: The data collection tools have not been shown to be valid **or** both reliability and validity are not described |
| **CONFOUNDERS**  *In the groups being compared (exposed vs. non-exposed; with intervention vs. without; cases vs. controls), are the participants comparable, or do researchers take into account (control for) the differences between these groups?*  *Consider whether (a) the most important factors are taken into*  *account in the analysis; (b) a table lists key demographic information comparing both groups, and there are no obvious dissimilarities between groups that may account for any differences in outcomes, or dissimilarities are taken into account in the analysis.*  *The following are examples of confounders: race, sex, marital status, age, SES, education, health status* | **Strong**: Most relevant confounders were controlled for (>80%) **or** there were no important differences between groups prior to the analysis.  **Medium**: Some relevant confounders were controlled for (60-79%)  **Weak**: Few relevant confounders were controlled for (<60%) **or** control of confounders was not described |
| **COMPLETE OUTCOME DATA**  *Are there complete outcome data (80% or above), and, when applicable, an acceptable response rate (60% or above), or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)?* | **Strong**: At least 80% of outcome data is complete and, if applicable, a response rate of 60% or above  **Medium**: 60-79% of outcome data is complete  **Weak**: Complete outcome data is less than 60% or complete outcome data/response rate is not described |

**Appendix B: Ethical Approval Form**

Result of your application to the Research Ethics Committee (application ID 448)

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

PI: Dr Dawn Watling  
Project title: The role of self-presentation, safety behaviours and cognitions in predicting comfort interacting in online and face-to-face situations in individuals with high levels of social anxiety  
  
REC ProjectID: 448  
  
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

**Appendix C: Preference for Facebook Interaction Scale**

Please rate the extent to which you agree or disagree with the following statements about interactions on Facebook and face-to-face.

1. I am more confident socialising on Facebook than I am face-to-face

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree |

2. I feel safer relating to other people on Facebook rather than face-to-face

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree |

3. I prefer communicating with other people on Facebook rather than face-to-face

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree |

4. Meeting and talking with people is better when done on Facebook rather than in face-to-face situations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree |

**Appendix D: Factor analysis of adapted Self-Presentation on Facebook Questionnaire**

|  |  |  |
| --- | --- | --- |
|  | Real Self face-to-face | False Self face-to-face |
| I have a good sense of who I am and many of the things I do in face-to-face interactions are a way of showing that | .824 |  |
| Who I am in face-to-face interactions is similar to who I really am | .726 |  |
| I have a good sense of what I want in life and face-to-face interactions are a way to express my views and beliefs | .815 |  |
| The way I present myself in face-to-face interactions is who I really am | .789 |  |
| I like myself and am proud of what I stand for and I show it in face-to-face interactions | .756 |  |
| I sometimes try to be someone other than my true self during face-to-face interactions |  | .699 |
| I am a completely different person in face-to-face interactions than who I really am |  | .520 |
| I give information about myself during face-to-face interactions that is not true |  | .872 |
| Sometimes I feel like I keep up a front in face-to-face interactions |  | .592 |

**Appendix E: Information and consent form**



**INFORMATION AND CONSENT FORM**

My name is Rebecca Lewis and I am a Trainee Clinical Psychologist studying at Royal Holloway. You have been invited to take part in a research study, which is being conducted as part of my Doctorate in Clinical Psychology. Before you decide to participate, I would like you to understand what the research will involve and why it is being conducted. Below you will be given some information about the research and then you will be able to decide if you would like to take part. Please read this information carefully. If you have any questions, then please contact me using the email address at the bottom of the page.

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

This research aims to investigate different factors that contribute to feelings of comfort interacting on Facebook and how these relate to how we think, feel and behave.

**Who is eligible to take part?**

You have been invited to take part because we would like to understand the factors that contribute to feelings of comfort interacting on Facebook and how these relate to how we think, feel and behave. To take part in this study you will need to be at least 18 years of age and have a Facebook account which you use. Unfortunately, if you are currently being treated for a mental health disorder (medication or talking therapy) you will not be able to participate.

**Do I have to take part?**

No. It is your choice whether you participate or not and your participation is entirely voluntary. If you do decide to take part, then you are free to withdraw from the study at any time and you do not need to give a reason. If you decide that you want to withdraw then you can contact me with your study identifier (using the email address at the bottom of this page) and I will delete your data. You will be able to withdraw up until the end of April 2018 when the data analysis for this study will be finalised.

**What would taking part involve?**

If you decide to take part, you will be asked to complete three brief screening questionnaires. Depending on your responses to these questionnaires, you may or may not be asked to complete some further questionnaires, asking for some general information about yourself and your use of social media and about your thoughts and behaviours whilst interacting online and face-to-face. It is estimated that it will take *up to* 30 minutes to complete all of the questionnaires.

**Are there any disadvantages or risks to taking part?**

Although it is unlikely, it is possible that you may feel uncomfortable answering some of the questions you are asked or may find the questions distressing. If this is the case, we have provided some information at the end of the study about seeking support if you are distressed.

You are also free to not answer questions which you do not feel comfortable answering.

**Are there any benefits to taking part and what will happen to the results?**

It is hoped that this research will inform us about the factors that influence feelings of comfort interacting online in individuals who feel anxious in face-to-face social situations. Since social media is a popular arena for maintaining and expanding social networks (Weidman et al., 2012) it is important to understand how our ways of thinking, feeling and behaving in these interactions may differ and may impact, or not impact, our feelings of comfort. This research will contribute some understanding towards this.

To thank you for participating, you will be invited to enter a prize draw where there will be three opportunities to win a £25 Amazon voucher. To be entered for this prize draw you will be prompted to complete a short form (first name, email address), which will be stored separately from your responses.

The results of the study will be written up as a doctoral thesis and submitted to an academic journal. The results may also be used in presentations about this work. Importantly, all of the information you provide will remain anonymous.

**Will my information remain confidential?**

All of the information that you provide will remain anonymous and is confidential. Individual responses will only be viewed by researchers, with permission of my supervisor, for research purposes. No information that would identify you personally will be collected as part of the study. You will be assigned a unique identifying number which will be displayed on the first page of the study. You are encouraged to write it down. This number will be stored in the study database where your responses will be recorded. It will be the only way in which your data can be linked to you if you wish to withdraw from the study after completing it. The database will be stored in a password protected secure network folder.

Contact details required to enter the prize draw (i.e. email address) will be stored separately from the research database and will not be linked to your unique study identifier.

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

If you have any questions about the study, please contact me using the following contact details:

Rebecca Lewis, Trainee Clinical Psychologist, Royal Holloway

Rebecca.Lewis.2015@live.rhul.ac.uk

If you have any concerns about how the study is being conducted, you can contact my supervisor using the details below:

Dr Dawn Watling

Dawn.Watling@rhul.ac.uk

Thank you for taking the time to read this information.

If you would like to take part in the research, please click continue…

You have been invited to participate in a research study exploring the factors that contribute to feelings or comfort interacting on Facebook and how these relate to how we think, feel and behave.

Have you…

* Read the information sheet and have understood the contents? (YES/NO)
* Had the opportunity to ask questions about the study and received satisfactory answers to any questions that you asked? (YES/NO)
* Understood that the data you provide will be anonymous? (YES/NO)
* Understood that you may withdraw your consent to take part up until the end of April 2018? (YES/NO)
* Confirm that you are over 18 years old and have a Facebook account that you use? (YES/NO)

Do you consent to voluntarily participate in this study? (YES/NO)

**Appendix F: Summary of research distributed to participants**



**Facebook use and social anxiety: Exploring predictors of comfort interacting on Facebook and face-to-face in people with high and low levels of social anxiety**

**Background**

There is a lot of research that suggests that those who feel anxious in social interactions feel more comfortable interacting online. The aim of this research was to explore levels of comfort interacting on Facebook in those with higher and lower levels of anxiety in social situations. We also explored some of the factors that may contribute to comfort on Facebook and face-to-face, specifically the thoughts that go through people’s minds when interacting face-to-face or on Facebook, the behaviours that people engage in during these interactions and impression management (presentation of real-self and false-self).

**Method**

Participants were recruited via the Royal Holloway research participant pool and through the Facebook contacts of the researcher. Participants completed some online questionnaires exploring the associations between thoughts, behaviours, impression management and levels of comfort on Facebook versus face-to-face. We looked at these associations in individuals who reported feeling more anxious in social situations compared to those who reported little anxiety in social situations.

**Key Findings**

1. As predicted by previous research, those who felt more anxious in social situations reported an increase in feelings of comfort on Facebook and a reduction in feelings of comfort face-to-face, compared to those who reported feeling less anxiety socially.
2. The combination of anxiety in social situations, thoughts, behaviours and impression management allowed us to significantly predict how comfortable someone would feel on Facebook compared to face-to-face.
3. Feeling able to present one’s real-self face-to-face was associated with a significant *decrease* in reported feelings of comfort interacting on Facebook compared to face-to-face.
4. For those who reported lower levels of anxiety in social situations, presenting one’s false-self in face-to-face interactions was associated with a significant *increase* in comfort interacting on Facebook compared to face-to-face.
   1. This relationship was not found for those who reported feeling more anxious in social situations.
5. Cognitions and behaviours were not significantly independently associated with comfort on Facebook.

**Questions to consider**

We are interested in your thoughts on the results of this research. Some questions to consider are:

1. Why do you think presenting one’s false-self face-to-face was associated with increased comfort on Facebook only for those who experience low levels of anxiety in social situations but not those who experience high levels of anxiety in social situations?
2. What do you think is the **impact** of these findings for people who feel anxious in social interactions?
3. Do you have any other comments?

**Appendix G: Qualitative analysis, thematic map and participant quotes**

**Thematic map.**

Information less likely to be misinterpreted

Face-to-face communication is more genuine than Facebook

**FACTORS CONTRIBUTING TO COMFORT FACE-TO-FACE**

You do not have to respond immediately and can plan what to say

Face-to-face cues

Facebook is “fake”

**FACTORS CONTRIBUTING TO COMFORT ON FACEBOOK**

Face-to-face communication more private than Facebook

Face-to-face communication less permanent than Facebook

Avoidance of being seen, awkwardness and making mistakes

Can widen/maintain social networks

**Main Themes, sub themes and example quotes.**

|  |  |  |
| --- | --- | --- |
| Main Theme | Sub Theme | Quotes |
| **Factors contributing to comfort face-to-face** | The presence of face-to-face cues for communication | *“Can read body language”* (Participant 4, high SA)  *“Can look at facial responses and body language”* (Participant 5, low SA)  *“It’s easier to gauge a person’s reaction/response face-to-face”* (Participant 9, high SA)  *“I can see the other person. This means I can see the effect of my words on them and understand the meaning behind their words better”* (Participant 12, high SA)  *“It’s easier to gauge reactions to things you say”* (Participant 18, low SA)  *“You can see people’s reactions”* (Participant 22, low SA)  *“Eye contact is important to me”* (Participant 23, low SA)  *“Body language and facial expressions are important and also intonation”* (Participant 24, low SA)  *“Facial expression feedback is easier to interact with and understand”* (Participant 25, low SA)  *“There is more feedback - in face to face interactions you can read body language.”* (Participant 31, low SA)  *“Better communication using body language.”* (Participant 35, low SA)  *“Talking to people face to face feels natural to me. I see people's body language, I feel their presence”* (Participant 36, low SA)  *“It's easier for people to understand your tone and meaning better in face to face”* (Participant 41, low SA)  *“You can immediately see their reactions to you”* (Participant 48, low SA)  *“Able to see body language and more easily interpret reactions”* (Participant 50, low SA)  *“I can receive signals and body language from the other person.”* (Participant 52, high SA)  *“More natural - no visual cues i.e body language on fb to show you how someone is truly feeling”* (Participant 56, low SA)  *“Can see how people feel and react.”* (Participant 58, low SA)  *“You can see people’s expressions and get more of an idea how they are responding to you*.” (Participant 62, low SA)  *“I can gauge the other person much better rather than on Facebook”* (Participant 64, low SA)  *“I can see their facial expressions”* (Participant 65, high SA)  *“When interacting face-to-face, you can generally read people better and communicate more clearly as you can see people’s true facial expressions and gestures.”* (Participant 69, low SA)  *“Easier to read body language/other person’s sentiment”* (Participant 78, high SA)  *“It’s easier to tell emotion in a face to face conversation compared to over text”* (Participant 79, high SA)  *“Facial expressions help”* (Participant 80, high SA)  *“It’s easier to gauge how the other person is responding to what you’re saying and how interested they are by what you are saying”* (Participant 85, high SA)  *“Face to face I get to see people’s reactions”* (Participant 86, high SA)  *“Able to see their reactions”* (Participant 90, high SA)  *“It is easier to see how the other person is interpreting what I say through facial expressions and body language.” (Participant 91, low SA)*  *“Because I like to see the automatic responses, not the masked.” (Participant 93, low SA)*  *“Ability to see reaction of the other person, real reaction” (Participant 95, low SA)*  *“Able to gauge people's emotional reactions through their facial expressions, tone, etc.” (Participant 96, low SA)*  *“I need eye contact, it is very important.” (Participant 97, low SA)* |
|  | Information less likely to be misinterpreted face-to-face | *“Too easy to misinterpret text [on Facebook]”* (Participant 8, high SA)  *“You miss out on a lot of information when online. Things can get misinterpreted”* (Participant 11, low SA)  *“Sometimes text can be misinterpreted”* (Participant 22, low SA)  *“Less misunderstandings [face-to-face] as able to clarify any confusion at the time”* (Participant 24, low SA)  *“Your thoughts and views can come across in the wrong way on Facebook.”* (Participant 41, low SA)  “*Less able to misinterpret feelings or words.”* (Participant 58, low SA)  “*The tone of a message can often get misinterpreted online.”* (Participant 69, low SA)  “*[face-to-face] nothing gets lost in text”* (Participant 77, high SA)  “*Text can be misinterpreted”* (Participant 80, high SA)  “*Written conversations can be misinterpreted.”* (Participant 91, low SA) |
|  | Facebook is “fake” | *“Do not use Facebook much. Do not feel like it reflects what I am like or what others are like.”* (Participant 6, high SA)  *“Facebook can feel a bit fake”* (Participant 9, high SA)  *“I'm very aware that people post the best pictures of themselves and photos where they're having a fantastic time”* (Participant 20, low SA)  *“Not everything on Facebook is real”* (Participant 28, low SA)  *“I don't think Social media will ever be an accurate representation of a person or life.”* (Participant 64, low SA)  *“Facebook on the other hand, sometimes feel more fake or does not seem to really show what people are thinking/really want to be saying”* (Participant 86, high SA)  *“[Facebook] feels fake”* (Participant 95, low SA) |
|  | Face-to-face communication less permanent than Facebook | *“It [Facebook] feels more permanent*.” (Participant 27, high SA)  *“Things done through Facebook feel more traceable and permanent than done in person”* (Participant 33, low SA)  *“[Face-to-face] I can correct myself**and worry less about saying the wrong thing as it is not recorded in writing … like it is on Facebook”* (Participant 52, high SA)  “*[Would feel more comfortable on Facebook] if it would not be there forever and could be used against you later.”* (Participant 93, low SA) |
|  | Face-to-face communication more private than Facebook | *“Other people can see what you have put on Facebook”* (Participant 27, high SA)  *“I can correct myself**and worry less about saying the wrong thing as it is not … witnessed by lots and lots of other people like it is on Facebook … less of an audience to make judgements”* (Participant 52, high SA)  *“Facebook is more public. Prefer one-to-one interactions which are face-to-face”* (Participant 54, high SA)  “*More individual/private in person”* (Participant 77, high SA) |
|  | Face-to-face communication is more genuine | *“[I feel more comfortable face-to-face because it is] more genuine* “(Participant 15, low SA)  *“It feels like more genuine interaction”* (Participant 17, low SA)  *“More genuine”* (Participant 78, high SA)  “*Face to face I get to see people’s reactions … and overall a more genuine and natural type of communication”* (Participant 86, high SA) |
| **Factors contributing to comfort on Facebook** | You do not have to respond immediately and can plan what to say | *“You have more time to consider your response to people you don’t know very well”* (Participant 19, low SA).  *“Can plan and re-word what I say”* (Participant 29, high SA)  *“Can think what to say first”* (Participant 51, high SA)  *“No obligation to reply if I’m feeling overwhelmed and can’t think of a response”* (Participant 57, high SA)  *“Able to think through responses before sharing them”* (Participant 61, high SA)  *“You can prepare what to say which makes it less likely to make a mistake”* (Participant 67, high SA)  *“Interactions don’t require an immediate response (can be delayed)”* (Participant 68, high SA)  *“You can think about and rephrase what you say to people/post”* (Participant 71, high SA)  *“Comfort of planning what to say beforehand”* (Participant 73, high SA)  *“You don’t have to respond immediately”* (Participant 84, high SA)  *“You have time to think about what you are going to say”* (Participant 87, high SA)  *“Can think about what you say before you send”* (Participant 89, high SA) |
|  | Avoidance of being seen, awkwardness and making mistakes | *“On Facebook, you have the comfort factor of not seeing the awkwardness in each other’s body language, you can just comment freely”* (Participant 49, low SA)  *“There are no awkward pauses in the conversation on Facebook”* (Participant 57, high SA)  *“I can stop and think or check some information to answer friends accurately”* (Participant 63, low SA)  *“You can prepare what to say which makes it less likely to make a mistake”* (Participant 67, high SA)  *“Not directly in front of the person”* (Participant 68, high SA)  *“People are unable to see my face which may give away signs that I’m nervous/anxious/inadequate compared to them … face-to-face interaction involves replying instantly and you may say something stupid or not know what to say at all.”* (Participant 71, high SA)  *“They cannot see me”* (Participant 76, high SA)  *“I get too nervous face-to-face, I am more comfortable getting to no someone when I don’t have to show myself”* (Participant 83, high SA)  *“They cannot see you”* (Participant 84, high SA)  *“It is easier to avoid awkward or embarrassing moments”* (Participant 87, high SA)  *“Lack of awkward silences”* (Participant 88, high SA)  *“There isn’t any other factors involved like spitting when speaking* … *if you make a mistake can delete and type again”* (Participant 89, high SA) |
|  | You can widen/maintain social networks | *“Because it is easier to seek out like minded / interested people [on Facebook] – face to face is limited by location, work environment”* (Participant 14, low SA)  *“It is sometimes easier to interact with past friends who you don’t meet up or speak to but still like to show an interest in what they are doing, life events etc.”* (Participant 42, low SA)  *“There are some people who are friends of friends really, with whom I interact a lot on Facebook, and it feels like we have a real rapport.”* (Participant 49, low SA) |

1. This included information about where participants could seek support for their mental health and/or feelings of suicidality. [↑](#footnote-ref-1)
2. After reading the debrief page, participants were referred to a separate online survey to enter their email address for entry into a prize draw to compensate them for taking part. [↑](#footnote-ref-2)