Keeping an eye on the self: The effects of seeing oneself during online video interactions in those with elevated social anxiety

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ABSTRACT

Research on the Clark and Wells (1995) model of Social Anxiety Disorder has established a number processes that maintain social anxiety in face-to-face settings. Yet, little is known about whether similar maintenance mechanisms are activated during online interactions. The current study aimed to examine differences in anxiety, socially anxious thoughts, self-imagery, subjective ratings of performance, self-focused attention and eye-tracked visual attention during online video conversations in participants with high or low social anxiety. Additionally, a novel experimental manipulation was conducted to explore the impact of the presence or absence of a live self-video feed during the online social interaction on the abovementioned factors. Consistent with predictions, individuals in the high social anxiety group reported more anxiety, a greater number of socially anxious thoughts, heightened self-focused attention and more negative subjective evaluations of performance than participants in the low social anxiety group. No significant differences were identified between the groups concerning self-imagery or eye-tracked visual attention. With regards to the effect of the self-video, both participant groups experienced greater self-focused attention, more socially anxious thoughts and reduced visual attention directed to the conversation partner's face when the self-video was present compared to when it was absent. No significant differences were identified between anxiety levels, evaluations of performance or intensity of self-imagery. The findings suggest that social anxiety appears to have similar maintenance processes online and the effect of seeing oneself through a live video feed during a social interaction is associated with a number of unhelpful effects. The present study provides a foundation for further research looking at social anxiety in online social interactions and has implications for traditional theoretical models, as well as Internet-delivered interventions for social anxiety.

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INTRODUCTION

1.1 Overview of Introduction Chapter

Social Anxiety Disorder (SAD) is one of the most frequent anxiety disorders, with a lifetime prevalence of between 5% and 12% (Grant et al., 2005; Kessler et al., 2005). In essence, the disorder is characterised by a fear of acting in a way that will be negatively evaluated by others (American Psychiatric Association [APA], 2013). There are a number of theoretical models that have set out to explain its aetiology and maintenance, however, the cognitive behavioural account is focused upon in this chapter as this is recommended to guide assessment and interventions for SAD (National Institute of Clinical Excellence [NICE], 2013).

Cognitive behavioural models (Clark & Wells, 1995; Rapee & Heimberg, 1997) predict that when individuals with SAD are exposed to social and/or performance situations they experience anxiety, socially anxious thoughts, negative self-perception, negative self-imagery and self-focused attention (SFA). Research has investigated the relationship between the aforementioned components and largely supports their role in the maintenance of social anxiety (SA) in face-to-face settings (Hackmann, Clark, & McManus, 2000; McManus, Sacadura, & Clark, 2008; Moscovitch & Hofmann, 2007). Notwithstanding, little is understood about how these factors that maintain SAD in face-to-face settings may present during online social interactions.

The empirical literature exploring how SA presents in an online context is far from clear-cut. There have been some studies which have shown that individuals with SA tend to feel more comfortable interacting via the Internet (Weidman et al., 2012), however others have suggested that socially anxious individuals continue to feel anxious when communicating online (Carruthers, Warnock-Parkes, & Clark,

submitted; Ryan, Warnock-Parkes, & Clark, in prep). The literature has been further complicated by the fact that rapid technological advancements have changed the nature of online interactions, with many programmes enabling video communications that bares greater resemblance to face-to-face situations.

A key difference between text-based and video-based online communication is that the video component reduces the control that individuals have over their presentation and makes it harder to hide visible aspects of the self that individuals with SA may be concerned about, such as blushing or shaking (Clark, 2005). Recently, Vriends, Meral, Bargas-Avila, Stadler, and Bögels (2017) identified that individuals with sub-clinical and clinical levels of SA experience high levels of SFA during online video conversations. The findings indicate that certain cognitive-behavioural mechanisms may be activated during online video communications, however the authors did not explore additional maintenance factors associated with SA. Moreover, the online conversation was set-up with the live video feed of the self present on screen during the entire conversation and so the effect of having this switched-on or switched-off was not compared. Exploring the impact of the live self-video feed is important, as evidence based interventions for SAD include a technique termed "video feedback", which involves individuals viewing a retrospective video of themselves engaging in a social interaction. Video feedback has been associated with improvements in negative self-evaluations of performance and decreases in SA in both clinical and subclinical samples (Harvey, Clark, Ehlers, & Rapee, 2000; Kim, Lundh, & Harvey, 2002; McManus et al., 2009). To the author's knowledge there has been no examination of the impact of a live video feed of oneself engaging in a social interaction, and so little is known about whether this is associated with helpful or unhelpful effects.

There have been studies which have explored the effect of viewing one's reflection in a mirror with some findings demonstrating that the mirror image may be utilised to update negative self-evaluations akin to video feedback (Bögels, Rijsemus, & De Jong, 2002), however other studies using mirrors have revealed a number of unhelpful consequences including heightening SFA, anxiety and negative self-appraisals (Bolt, Ehlers, & Clark, 2014; Canvin, Janecka, & Clark, 2016; Hofmann & Heinrichs, 2003). Research into the helpfulness of viewing a live video image of the self is timely as evidence based Cognitive Behavioural Therapy (CBT) for SAD has been recently adapted to be delivered via the Internet and is soon to be disseminated in Improving Access to Psychological Therapy (IAPT) services. The Internet-delivered programme incorporates web linked video communication between therapist and service user, with the self-video feed visible on screen during the conversation (Stott et al., 2013), however this arrangement has been designed in the absence of research assessing the helpfulness of having a live video present during interactions.

Based on the theoretical and empirical background, the current study proposes to examine the helpfulness of having a self-video visible during online video interactions in those with high social anxiety (HSA) and low social anxiety (LSA). Further, the study aims to explore whether maintenance processes of the Clark and Wells (1995) cognitive model of SAD are activated during online social interactions.

The introduction chapter will begin with an overview of SAD alongside evidence demonstrating that high levels of SA are found within non-clinical populations. This will then be followed by a description of the Clark and Wells (1995) model of SA with the evidence presented for specific maintenance components in face-to-face and online settings. The chapter will move on to discuss current interventions for SAD, both in face-to-face and in an online context, with a particular focus on the

impact of video feedback. Ultimately, the chapter will pull together the empirical and theoretical literature and will conclude with a brief summary of the present study and the research questions it sets out to answer.

1.2 Defining Social Anxiety

1.2.1 Clinical diagnoses

SAD is characterised by a marked and persistent fear of negative evaluation in social and/or performance situations. More specifically, individuals with SAD fear that they will act in a way that is considered humiliating and that their behaviour will be scrutinised by others (APA, 2013). Feared situations may extend to a wide range of settings, such as meeting people for the first time, giving formal presentations or eating in public (Carr & McNulty, 2016). Anxiety is almost always provoked during social interactions and is often accompanied by negative thoughts about performance, shifts in attention and unpleasant bodily sensations (Steinert, Hofmann, Leichsenring, & Kruse, 2013). Due to the intense and debilitating nature of SAD, individuals tend to avoid feared interactions or endure them with great distress (APA, 2013).

SAD is associated with significant impairments in fundamental domains of everyday life. According to the Diagnostic Statistical Manual of mental disorders (DSM-5, APA, 2013), a diagnosis of SAD is applied when the fear and/or avoidance of situations significantly impairs social and/or occupational functioning. Empirical studies have shown that SAD can have a negative impact on the formation and maintenance of relationships and leads to impairments in academic and work performance (Taylor & Alden, 2008; Wittchen & Beloch, 1996). In addition, young people with high levels of SA are considerably more likely to drop out of school and as adults have higher rates of unemployment compared to those low levels of SA

(Lecrubier et al., 2000; Stein & Kean, 2000; Wittchen & Beloch, 1996). Moreover, SAD is associated with lower self-reported quality of life and higher rates of depression and suicide, even in the absence of comorbid depression (Fehm, Pelissolo, Furmark, & Wittchen, 2005). Taken together, the above highlights the significant social and psychological impairments associated with the disorder, and underscores the need for effective psychological treatments (Miloff, Marklund, & Carlbring, 2015).

1.2.2 Social anxiety in community samples

According to NICE (2013), over 50% of individuals with clinically significant SAD fail to engage with interventions. In addition, those who do seek treatment typically wait 15 to 20 years until their symptoms are severe (NICE, 2013; Ruscio et al., 2008). This may go some way in explaining why high levels of SA are found in non-clinical populations (Stein, Torgrud, & Walker, 2000). For example, Furmark and colleagues (2002) identified that 7% to 13% of respondents met diagnostic criteria for SAD in 43 community surveys across 19 countries.

Although the APA classify SAD as a disorder using distinct criteria (APA, 2013), it has been argued that SAD is located at the upper end of a continuum of SA, ranging from subclinical to clinical levels of severity (Dell'Osso et al., 2014). This is in line with research which has identified that a proportion of the population experience high levels SA but not to the intensity or degree of functional impairment to warrant a diagnosis of SAD (Knappe, Beesdo, Fehm, Lieb, & Wittchen, 2009).

Dell'Osso and colleagues (2014) explored the similarities and differences between threshold and sub-threshold SAD. The authors identified that those with sub-threshold SAD demonstrated intermediate symptoms and functional impairments between those diagnosed with the disorder and a control group. This is in line with a

well-established procedure in SA research to utilise a non-clinical sample of participants, typically higher education students who score high in SA to act as an analogous population to those with SAD (Canvin et al., 2016). For the purpose of this piece of work, terms HSA or highly socially anxious will signify participants recruited from non-clinical community samples who display elevated levels of SA, whereas the term SAD will refer to participants recruited from clinical populations.

1.2.2.1 Social anxiety in higher education students

The majority of undergraduate (84.3%) and postgraduate (58.2%) students in the United Kingdom are under the age of 30, which presents as a key timeframe for SAD (UK Universities, 2016). This is because the onset of heightened SA typically occurs within adolescence, yet in reality, many individuals wait over a decade to seek support (NICE, 2013). Thus, high levels of SA might be under-identified and under-treated in a young adult population. This is in accordance with a survey that was conducted with 1007 students across UK higher education institutions, showing that 10% of students reported marked to severe SA symptoms (Campbell, Bierman, & Molenaar, 2016). Moreover, a recent study by Ryan, Warnock-Parkes and Clark (in Prep) identified that 18% of the student sample from a number of universities in Oxford met criteria to be included in a HSA group. The authors found that the mean on the Brief Fear of Negative Evaluation Scale (Leary, 1983), which was utilised to assess the degree of SA, was comparable to the mean of a clinical sample reported by Weeks, Heimberg, Rodebaugh, and Norton (2008). This demonstrates the feasibility of recruiting from a young adult community sample.

1.3 Cognitive Behavioural Models of SAD

Numerous models have highlighted the importance of understanding the processes that underscore high levels of SA and SAD (Moscovitch et al., 2013). Though several approaches contribute to our understanding of SAD, such as psychodynamic and biological explanations, it is beyond the scope of this study to explore each in great detail. Instead, a specific focus will be placed upon a cognitive-behavioural perspective. Clark and Wells (1995) and Rapee and Heimberg (1997) models are two of the most widely cited and accepted cognitive behavioural explanations of SAD and are recommended by NICE (2013) to guide clinical interventions. In the current study, the Clark and Wells (1995) cognitive model will be primarily focused upon as this has been utilised to guide a newly developed and trailed Internet-delivered intervention for SAD (Stott et al., 2013), which is particularly relevant to the current study's aims. A description of the model will be outlined below.

1.3.1 Clark and Wells (1995) Cognitive Model of SAD

According to Clark and Wells (1995), socially anxious individuals develop a series of rules, assumptions and beliefs about themselves in social situations based on their early life experiences. The cognitions centre on a strong desire to project a favourable impression of the self, paired with a belief that their personal qualities fall short of the characteristics needed to meet perceived social standards (Fang, Sawyer, Asnaani, & Hofmann, 2013).

SOCIAL
SITUATION

ACTIVATES
ASSUMPTIONS

PERCEIVED SOCIAL
DANGER

PROCESSING
OF SELF AS A
SOCIAL
OBJECT

SAFETY
BEHAVIOURS

SOMATIC &
COGNITIVE
SYMPTOMS
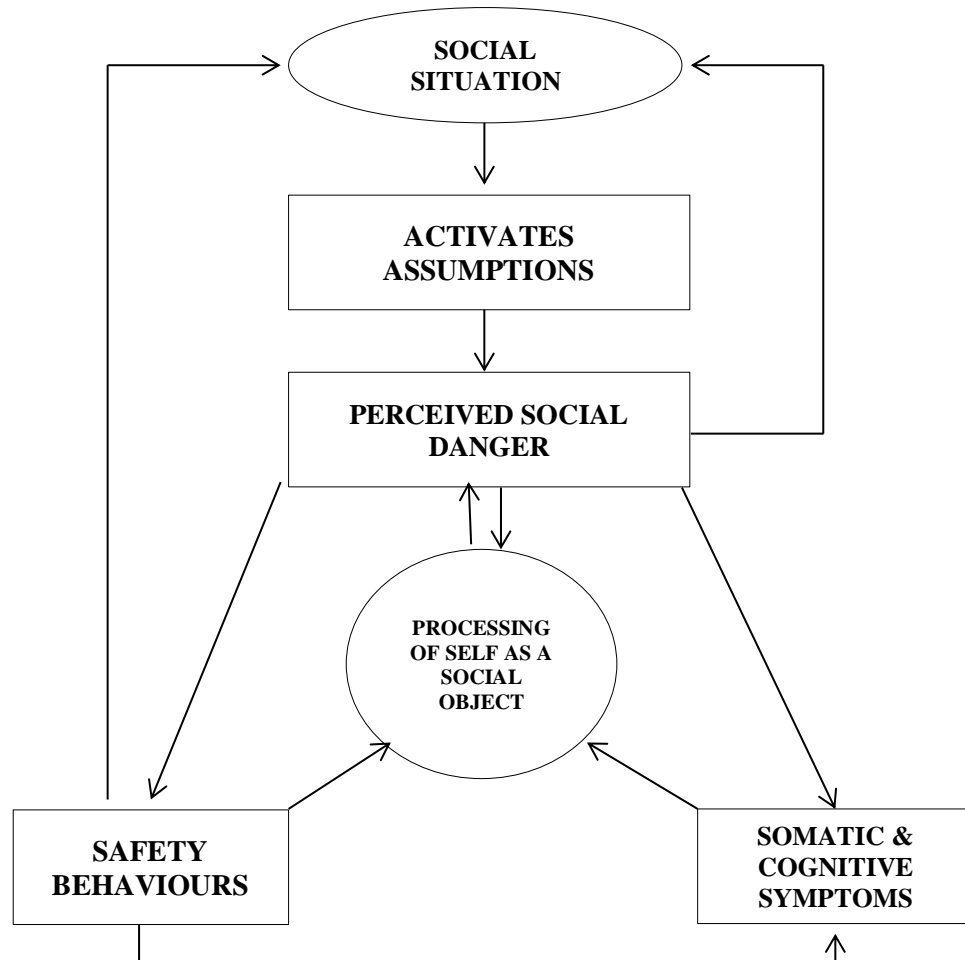
Figure 1: Clark and Wells (1995) model.

Clark (2005) describes a number of beliefs and negative assumptions that may be activated during social interactions, such as beliefs about the negative consequences of failing to meet their exceptionally high standards. Research has supported this viewpoint; individuals with HSA and SAD have been shown to rate their social performance more negatively in relation to their perceived social standard (Moscovitch & Hofmann, 2007; Wallace & Alden, 1991), and to underestimate their performance compared to objective ratings of their actual performance (Ashbaugh, Antony, McCabe, Schmidt, & Swinson, 2005; Norton & Hope, 2001). Negative automatic thoughts, such as 'others will think I am weird' or 'I will look weak', can become

activated during social interactions. Undoubtedly, these beliefs taint an individuals' view of themselves. For instance, individuals with HSA overestimate the visibility of their anxiety symptoms relative to objective ratings from others (Bruch, Gorsky, Collins, & Berger, 1989).

According to the model, attention tends to shift towards the self and this is associated with greater engagement in self-monitoring of internal sensations, thoughts and images. The shift in attention has been termed SFA and is defined as an awareness of self-referent and internally generated information (Ingram, 1990). The model predicts that the increased awareness of internal information is utilised to construct a detailed self-impression or mental image of how others are evaluating them from an external-observer perspective ('self as a social object'; see Figure 1). These self-images have been found to be associated with early aversive social experiences, such as being mercilessly teased for stuttering when reading aloud in school (Hackmann et al., 2000). Individuals can draw upon such images to evaluate how they are coming across in the present context, even if the objective evidence would suggest otherwise.

High levels of anxiety are maintained by safety behaviours, which are defined as physical or mental actions that are employed with the intention of preventing negative consequences from transpiring (Salkovskis, 1991). Examples of safety behaviours include wearing excessive amounts of clothing to conceal sweating, gripping tightly on the table to prevent trembling or mentally rehearsing sentences to ensure the flow of words (McManus et al., 2008). Clark and Wells (1995) have emphasised a number of ways in which safety behaviours negatively impact on SA; such as facilitating greater self-monitoring and increased levels of SFA. In addition, both safety behaviours and SFA taint social interactions by having the paradoxical effect of making the individuals' social performance less efficacious, which reinforces

anxiety about receiving negative evaluation during future social interactions (McManus et al., 2008; Trew & Alden, 2009).

Further to the described 'in situation' cognitive processing, the model suggests that a number of processes are activated before and after feared social or performance situations. Anticipatory processes include the activation of memories from previous negative social situations along with expectations about what the upcoming social interaction may entail, resulting in individuals' entering social encounters in a self-focused state. The self-focused state is associated with individuals becoming caught up with their own thoughts and feelings, which reinforces negative self-evaluations and results in them processing less external cues from their environment (Heimberg et al., 1990). Following social situations, individuals' engage in 'post-event processing' in which the social interaction is recalled in a way that minimises performance achievements and magnifies perceived shortcomings (Rapee & Lim, 1992; Stopa & Clark, 2001).

Overall, it is evident that the model places importance on the dysfunctional cognitions, negative self-perception and focus of attention in the maintenance SA. It is important to note that Rapee and Heimberg's (1997) model of SA similarly places significance to dysfunctional cognitions, negative self-perception and focus of attention in the maintenance of SAD. However, a difference lies in Rapee and Heimberg's (1997) proposition that individuals with SA have a tendency to direct their attention both internally and externally. In essence, individuals with SAD are suggested to oscillate between searching for threat in the environment and focusing their attention internally. Despite the suggestion that the attentional mechanisms may function differently, Rapee and Heimberg's (1997) model continues to emphasise the importance that SFA plays in enhancing the saliency of internally generated cues, which are subsequently utilised to

construct a mental representation of how the individual believes they are being perceived by others. In the following sub-sections, empirical evidence for the key mechanisms posited by Clark and Wells (1995) will be presented and applied to inform the aims of the present study.

1.4 Evidence for the Components of Social Anxiety

1.4.1 Socially anxious cognitions

Empirical studies have reported that individuals with HSA and SAD experience a greater proportion of negative automatic thoughts than those with LSA (Dodge, Hope, Heimberg, & Becker, 1988; Schultz & Heimberg, 2008). Several methods have been implemented to assess the nature of cognitions in SA, with self-report questionnaires being the most common measure (Hofmann & Heinrichs, 2003). Negative cognitions, such as "I will make a fool of myself", tend to focus on an overestimation of social danger and an underestimation of one's abilities to cope with such encounters, which can accentuate negative judgements about oneself in social situations (Bögels & Zigterman, 2000).

Wells, Stopa, and Clark (1993) developed the Social Cognitions Questionnaire (SCQ), which assesses the frequency of common thoughts that centre on self-evaluative fears experienced by those with high levels of SA. The thoughts are separated into three main constructs; negative self-beliefs (e.g. "I am foolish"), fear of failure (e.g. "I will babble or talk funny") and fear of negative evaluation (e.g. "People will stare at me"). Tanner, Stopa, and De Houwer (2006) explored anticipatory thoughts about an upcoming speech using the SCQ in a group of 29 participants with HSA and 28 participants with LSA. The authors reported that the HSA group experienced a greater

number of socially anxious thoughts and displayed stronger belief ratings about each thought. A study by Mansell and Clark (1999) showed that the HSA group tended to recall more negative words in comparison to the LSA group about how they thought they would appear to others when anticipating giving a speech. Moreover, Perini, Abbott, and Rapee (2006) demonstrated that socially anxious cognitions occur post social interaction, with the SAD group facing more performance related negative thoughts following an impromptu speech in front of a video camera compared to non-anxious controls. The above research suggests that socially anxious individuals experience a greater frequency of negative thoughts about themselves and their performance in social interactions. Due to the anxiety-provoking nature of thoughts associated with SA, it makes sense as to why individuals may want to engage in detailed monitoring in an attempt to reduce the likelihood of such thoughts materialising.

1.4.2 Negative self-perception

Individuals with HSA consistently report that their social performance is worse than those with LSA (Bögels & Mansell, 2004; Tanner et al., 2006). The subjective view of how one is coming across is based on their thoughts, feelings and bodily sensations and contributes to a biased self-representation (Ng, Abbott & Hunt, 2014). Biased self-representations are maintained by social interactions being recalled in a way that magnifies performance shortcomings and minimises performance achievements (Alden & Wallace, 1995). Moreover, heightened focus on negative self-perception increases access to negative self-images that typically correspond to deeply held fears about appearing socially incapable, visibly anxious or physically unappealing and are often deeply entrenched in autobiographical memories (Hackmann et al., 2000; Moscovitch, Gavric, Merrifield, Bielak, & Moscovitch, 2011). Clark and Wells (1995)

suggest that socially anxious individuals experience recurrent and intrusive negative self-images spontaneously during feared situations and these are often recalled from an observer ('external') perspective as if they are observing themselves through the eyes of another person, rather than a field ('own eyes') perspective.

Hackmann and colleagues (1998) investigated the proposition that higher instances of observer perspective self-images are found in socially anxious individuals by conducting semi-structured interviews with 30 individuals with SAD and compared this to 30 non-anxious controls. The authors reported that 77% of the SAD group experienced vivid and recurrent mental images of themselves in social encounters and that these mental images were more likely to involve an observer perspective compared to controls. Coles, Turk, Heimberg, and Fresco (2001), Wells, Clark, and Ahmad (1998) and Wells and Papageorgiou (1999) explored the perspective of self-images further by asking individuals with HSA to recall a recent social situation and to rate the perspective of the imagery that was evoked on a continuum ranging from entirely looking out through their eyes (field perspective) to entirely observing oneself from an external point of view (observer perspective). All three studies reported that HSA individuals were more likely to take the observer perspective whereas those with LSA were more likely to take the field perspective. These findings are in line with the theoretical models which posit that individuals with SAD visualise themselves from a third person perspective when in socially threatening situations, creating a biased 'object' which represents the self (Clark & Wells, 1995; Rapee & Heimberg, 1997).

A number of studies have investigated the influence of negative self-imagery through experimental procedures and shown that it is a causal factor in generating poorer subjective ratings of social performance. Hirsch, Clark, Mathews, and Williams (2003) asked individuals with SAD to visualise negative imagery when engaging in a

conversation and identified that participants experienced greater levels of anxiety and safety behaviours compared to when visualising neutral imagery. In addition, Spurr and Stopa (2003) reported that when individuals with HSA actively engaged in an observer perspective during a social situation versus when they imagined the situation from their own eyes, they experienced more socially anxious cognitions, poorer subjective ratings of performance and utilised a greater number of safety behaviours than when they engaged in a field perspective. In addition to the findings that highly socially anxious individuals experience more vivid self-imagery that impairs performance, there are links between negative self-imagery and lower levels of self-esteem, faster retrieval of negative memories and greater levels of anxiety (Hirsch, Meynen, & Clark, 2004; Hirsch et al., 2003; Hulme, Hirsch, & Stopa, 2012; Ng et al., 2014; Stopa & Jenkins, 2007; Vassilopoulos, 2005).

Overall, the reviewed research underscores the prominence of negative self-evaluations in those with HSA and SAD. Moreover, the evidence highlights the negative impact of self-images on the maintenance of SA, emphasising the importance of targeting this component of the model during psychological interventions. To the author's knowledge, no research has investigated negative self-imagery during online interactions, which the present study seeks to explore further.

1.4.3 Self-focused attention (SFA)

Cognitive behavioural models suggest that attentional biases play a significant role in the maintenance of SAD (Clark & McManus, 2002; Heimberg, Brozovich, & Rapee, 2010). That is, when highly socially anxious individuals are faced with a feared social or performance situation they shift their attention away from externally threatening cues and instead focus on internally generated stimuli, such as physiological

arousal, thoughts and imagery. Internal stimuli is utilised to confirm negative self-images and impressions of how one is coming across and applied to evaluate social performance (Norton & Abbott, 2016). Although increased awareness of self-referent information is demonstrated in other anxiety disorders, it is distinctive to SA in that it provokes fears concerning negative evaluation associated with observable signs of anxiety, for example, sweating, trembling and blushing (Spurr & Stopa, 2002). Research has identified that individuals with HSA have a tendency to monitor physical anxiety symptoms and this is related to increases in negative self-imagery and fears of negative appraisal (Wells & Papageorgiou, 1999). As individuals become absorbed with their own self-focus they are less able to process external cues, resulting in a less accurate recall of external stimuli following a social interaction (Heimberg et al., 1990). There is ample evidence to show that heightened SFA is found in individuals with HSA and SAD (Bögels & Mansell, 2004; Clark & McManus, 2002; Hope, Gansler, & Heimberg, 1989; Spurr & Stopa, 2002). This has been supported by recent neuropsychological research, demonstrating an association between SFA and hyperactivation of neural structures related to the processing of self-referential stimuli and bodily sensations in those with HSA (Boehme, Miltner, & Straube, 2015).

1.4.3.1 Causal impact of SFA

McManus and colleagues (2008) conducted a study whereby they manipulated the use of safety behaviours and SFA through verbal instructions with individuals either high or low in SA. The results showed that when both groups applied more safety behaviours and engaged in greater SFA they experienced more anxiety, believed that their anxiety symptoms were increasingly visible and rated their overall performance as poorer. The findings emphasise the unhelpful influence of SFA in the maintenance

of SA. However, a limitation of the aforementioned research is that the authors manipulated safety behaviours and SFA together and so it is difficult to disentangle the effect that each component has on anxiety and performance ratings.

A number of studies have focused solely on manipulating SFA through a range of techniques, such as giving instructions or adding mirrors to an experimental task (Vriends et al., 2017). Firstly, increasing the prominence of physiological symptoms through exercise or false heartbeat feedback has been shown to amplify SFA, and this is associated with greater anxiety and negative ratings of performance (Fenigstein & Carver, 1978; Mansell, Clark, & Ehlers, 2003; Papageorgiou & Wells, 2002; Wegner & Giuliano, 1980). Secondly, the instruction to focus on internal bodily sensations has resulted in significant increases in SFA in those with SAD (Woody & Rodriguez, 2000), high blushing anxiety (Bögels & Lamers, 2002) and HSA (Canvin et al., 2016; Zou, Hudson, & Rapee, 2007). Interestingly, in each of the aforementioned studies, the self-focus instruction also induced SFA in comparison groups of those with low SA and low blushing anxiety. Correspondingly, both high and low SA groups have been shown to experience significantly higher levels of SFA when they view a reflection of themselves in a mirror compared to a condition when the mirror was absent (Bögels et al., 2002; Bolt et al., 2014). This demonstrates that such effects are not exclusive to those with SA and that experimentally manipulating SFA through instructions and the presence of mirrors has a similar self-focused inducing effect regardless of SA level.

The effect of manipulating SFA on other factors associated with SA has been examined in the literature. Research has shown that when SFA is induced through instructions there is a rise in levels of anxiety (Bögels & Lamers, 2002; Canvin et al., 2016; Woody & Rodriguez, 2000; Zou et al., 2007). However, when mirrors have been utilised to manipulate SFA mixed results have been documented. For example, Bolt and

colleagues (2014) demonstrated that placing a mirror in the testing room whilst participants completed a non-social interaction task increased SFA and anxiety in both HSA and LSA groups and amplified negative self-evaluation in the HSA group. In comparison, two studies have employed mirror exposures and failed to identify a relationship between SFA and anxiety (Bögels et al., 2002; Hofmann & Heinrichs, 2003). To the author's knowledge, no research to date has examined whether presenting individuals with a 'live reflection' through a video feed has a similar or different impact to mirror exposures, and one of the present study's aims is to explore this further.

Norton and Abbott (2016) have evaluated the literature on SA and SFA to date and noted that there are a number of methodological limitations across studies exploring SFA in SA. A large proportion of the research has relied on self-report measures (Alden & Mellings, 2004; Bögels & Lamers, 2002; Hodson, McManus, Clark, & Doll, 2008; Perowne & Mansell, 2002; Voncken, Dijk, de Jong, & Roelofs, 2010; Woody, 1996; Woody & Rodriguez, 2000), while others have utilised more internally valid measurements, such as dot-probe paradigms to assess attention towards internal versus external cues, however these studies lack ecological validity as they involve non-social interaction tasks (Bradley, Mogg, & Lee, 1997; Deiters, Stevens, Hermann, & Gerlach, 2013; Mansell et al., 2003; Mills, Grant, Judah, & White, 2014; Pineles & Mineka, 2005). Norton and Abbott (2016) state that research should be dedicated to exploring SFA using ecologically valid social tasks with measurements beyond self-report. The present study seeks to address such methodological limitations within its design.

In summary, evidence suggests that individuals with HSA exhibit increased levels of SFA compared to those with LSA. There has been noteworthy research, which indicates that experimentally induced SFA is associated increased levels of anxiety and negative self-evaluation which supports the notion that SFA is a key process involved in

maintaining SA, however the findings are mixed. As it stands, no research has explored the effect of manipulating a live video image on levels of SFA, and whether this is associated with greater anxiety, socially anxious thoughts, negative self-evaluation and self-imagery. As a consequence, this will be addressed in the current study.

1.5 Evidence for the Components of SA in Online Interactions

More recently, attention has turned to whether the same processes that maintain SA in face-to-face settings are activated during online interactions. Computer-mediated communication (CMC) has become a ubiquitous method of staying connected with others over the past 15 years, especially among adolescents and young adults (Prizant-Passal, Shechner, & Aderka, 2016). CMC can be defined as any interpersonal interaction that takes place via computerised technology including email, instant messenger and video conversations (Shalom, Israeli, Markovitzky, & Lipsitz, 2015). Research has shown that 90% of students go online every day to engage in CMC (Trefflich, Kalckreuth, Mergl, & Rummel-Kluge, 2015), with 86% of young adults using web applications, such as Facebook, LinkedIn or Google Plus (Pew Research Centre, 2017). The online social world is increasingly becoming an important way of developing relationships, underscoring the importance of investigating how psychological processes of SA might work in an online context.

Prizant-Passal and colleagues (2016) conducted a meta-analysis reviewing the existing literature on SA and Internet use (instant messaging, email and games) using 22 studies with 13,460 participants. A medium sized positive correlation ($r=.34$) between SA and perceiving the Internet to be a more comfortable medium for social interaction compared to face-to-face settings was identified. A potential explanation for this is that

CMC allows for greater control over self-presentation, for example less visual or audio cues, and so it could be hypothesised that individuals with SAD experience fewer negative self-images and anxieties about coming across well during the interactions (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004). In comparison, there is a line of research which has demonstrated that individuals with higher levels of SA are likely to experience anxiety when interacting socially on Facebook (McCord, Rodebaugh, & Levinson, 2014). Furthermore, Ryan, Warnock-Parkes and Clark (in Prep) suggest that specific components of the Clark and Wells (1995) model of SA may be activated during online social interactions. The researchers asked individuals with HSA or LSA to complete a number of questionnaires focusing on their emotions, negative social cognitions and safety behaviours when using Facebook. The findings demonstrated that individuals with HSA reported greater anxiety, more socially anxious thoughts (e.g. "I write stupid things") and utilised more safety behaviours (e.g. "staying in the background on Facebook") than those with LSA.

More recently, one study has explored whether components of the Clark and Wells (1995) model appear during online video interactions (Vriends et al., 2017). Specifically, Vriends and colleagues' (2017) identified that both individuals with HSA and SAD experience greater levels of SFA when communicating with an attractive male confederate over video conferencing software. This preliminary research suggests that specific maintenance processes that exist in face-to-face settings may also be activated in online video interactions. However, this is an area that needs further exploration as little is known about whether additional mechanisms, such as socially anxious cognitions, negative self-evaluation and self-imagery, are present during online video communications.

1.6 CBT Interventions for SAD

Individual CBT based on the Clark and Wells (1995) model is recommended as the first line of treatment for SAD (NICE, 2013). CBT is an umbrella term for a wide range of interventions aimed at facilitating change to thoughts, feelings and behaviours (Herbert & Forman, 2011). CBT based on the Clark and Wells (1995) model comprises of a number of modules which are aimed at reversing the aforementioned maintaining factors including: (1) developing a personalised formulation; (2) conducting behavioural experiments to manipulate SFA and safety behaviours, and to test individuals negative beliefs; (3) attention training to shift one's focus externally; (4) video and still photograph feedback to update negative self-perceptions and self-imagery; (5) memory work to address socially traumatic memories, including stimulus discrimination and imagery re-scripting.

Randomised controlled trials (RCTs) have established the efficacy of individual CBT as a treatment for SAD in comparison to no treatment (Clark et al., 2006; Ledley et al., 2009), and to a number of psychological and pharmacological treatments, including group CBT, psychodynamic psychotherapy and exposure therapy (Mayo-Wilson et al., 2014). Despite the effectiveness of CBT-based treatments for SAD, the availability and accessibility of treatments pose a difficulty (Griffiths, 2013). As mentioned previously, a significant proportion of individuals with SAD and HSA do not seek support, leading to under diagnosis and under treatment (Katzelnick & Greist, 2001; Lydiard, 2001). This is concerning as symptoms of SAD tend to worsen without intervention and there is a low spontaneously remission rate (Ruscio, 2010). As a result of the low treatment-seeking rates, NICE (2013) has recommended for research to focus on adapting the delivery of existing interventions to target difficult-to-reach populations with SAD. One method may be through the introduction of Internet-delivered

interventions, as individuals are not required to be physically present during such social interactions.

The Internet offers a potential platform to increase the availability of- and facilitate engagement with- therapeutic intervention, particularly if individuals are fearful of face-to-face contact. Internet-delivered CBT has been established through the integration of technology and face-to-face psychological interventions for SAD (Andersson, 2009). Guided Internet-delivered CBT has shown to be an effective treatment for SAD, with findings supporting the short-term and long-term clinical benefits to individuals, as well as financial advantages to the treatment providers (Andersson, 2009; Carlbring, Nordgren, Furmark, & Andersson, 2009; Hedman et al., 2014).

Recent developments in Internet-delivered treatment for SAD have adapted all key features of Clark and Wells' (1995) evidence-based CBT protocol to be delivered online (Stott et al., 2013). Stott and colleagues (2013) provide online therapist support via webcam-linked communication. The authors explored the effectiveness of the Internet-delivered cognitive therapy programme with 11 individuals diagnosed with SAD and demonstrated that the reported reductions in SA were comparable to those demonstrated in RCTs of face-to-face cognitive therapy. In addition, no patients dropped out. This is promising given that Hans and Hiller (2013) reported a 15.31% attrition rate for face-to-face CBT for SAD. As mentioned previously, investigation into specific components of the Internet-delivered intervention is pertinent as the programme is soon to be disseminated in IAPT services.

1.6.1 Video feedback

Video feedback is a specific component of CBT that has been adapted for the online treatment programme for SAD (Wild et al., in prep). In face-to-face settings, video feedback involves presenting socially anxious individuals with a video playback of their social interaction in order for them to see a more accurate portrayal of how they appear to others. The technique is employed to update both negative self-imagery and negative self-perceptions by providing alternative evidence against one's own biased subjective ratings of performance. This is based on the idea that distorted self-images are linked to negative self-processing during social interactions, which in turn maintains anxiety symptoms (Aderka, 2009). Video feedback has been shown to be an effective component of CBT to generate more positive impressions of social performance and subsequently reduce anxiety in those with SAD (Warnock-Parkes et al., 2016) and high levels of SA (Harvey et al., 2000).

In the Internet-delivered CBT programme for SAD, video feedback involves service users engaging in video recorded interactions, such as conversations with a confederate for behavioural experiments, which are then played back similarly to the procedure in face-to-face settings (Stott et al., 2013). Latest research, which is currently in preparation, has confirmed that post task video feedback with cognitive preparation is effective when delivered as part of the programme (Wild et al., in prep). Cognitive preparation is a method which aims to counteract negative subjective evaluations of performance, by guiding individuals to shift their attention externally and watch the video as if they were watching a stranger (Harvey et al., 2000; Warnock-Parkes et al., 2016). Empirical studies have shown that cognitive preparation is a key technique which contributes to the beneficial effects of video feedback on perceptions of performance in those with HSA (Harvey et al., 2000; Kim et al., 2002; Rodebaugh, 2004) and in

treatment-seeking individuals with SAD (Rodebaugh, Heimberg, Schultz, & Blackmore, 2010; Warnock-Parkes et al., 2016). In fact, two studies have identified that cognitive preparation is needed for video feedback to effectively update negative self-perceptions and reduce anxiety (Orr & Moscovitch, 2010; Parr & Cartwright-Hatton, 2009). In essence, cognitive preparation allows individuals to shift their attention away from their biased self-perception to view the video as objective evidence of their performance. Based on this, if individuals are not trained to shift their attention externally whilst watching the video, it is conceivable that a self-video may act similarly to the effects of mirrors and increase self-awareness. However, to the author's knowledge, there has not been a detailed examination of SFA during video feedback and so this assertion cannot be supported by the current knowledge base.

1.6.2 Live video images

The distribution of evidence-based interventions over the Internet provides a unique opportunity to deliver 'live video feedback' via a video stream of the self during video conferencing conversations. The current procedure for online video interactions via the Internet-delivered intervention for SAD involves service-users observing a live video feed of themselves whilst they are speaking to a therapist, however this disappears when they engage in behavioural experiments with confederates (Stott et al., 2013). The videoconferencing features of the online treatment were designed in the absence of data exploring the helpfulness of having a video of the self-visible during live conversations. However, the clinical assumption is that viewing the live self-video during behavioural experiments might shift attention away from the conversation at hand and make patients feel more self-conscious.

As mentioned previously, there has been empirical research that has specifically

investigated the impact of viewing oneself in a mirror image in those with SA. For example, Bolt and colleagues (2014) found that HSA and LSA groups were significantly more self-focused and anxious when in the presence of a mirror. This is in accordance with a line of research which has demonstrated that the presence of mirror image increases SFA (Buss & Scheier, 1976; Carver & Scheier, 1978). Furthermore, a number of studies have demonstrated the unhelpful effects of SFA on levels of anxiety and self-evaluation (Bögels & Lamers, 2002; Bolt, Ehlers & Clark, 2014; Woody & Rodriguez, 2000; Zou, Hudson & Rapee, 2007), however two studies that have utilised mirrors to manipulate SFA have not identified such detrimental effects. Bogels, Rijsemus and De Jong (2002) demonstrated that although the mirrors increased SFA in those with HSA and LSA, the manipulation did not increase anxiety, anxious cognitions or negative self-evaluation. The authors made sense of these findings by suggesting that the mirror might have led to a more detailed search in the reflection for evidence of anticipated anxiety symptoms, which may have resulted in individuals receiving positive objective information about their appearance. Furthermore, Hofmann and Heinrichs (2003) demonstrated that the presence of a mirror reduced negative self-statements about the self in those with SAD. Taken together, it could be suggested that the mirrors may have been delivering an external source of information that helped to correct negative self-perceptions of performance and mental representations individuals with HSA and SAD hold of themselves.

In addition to research that has utilised a 'live image' via mirrors, two investigations by Vriends and colleagues (2017) have explored SFA using self-report measures during a video conferencing conversation. The authors also employed eye-tracking equipment to investigate how long participants directed their visual attention towards the self-video during a video conferencing conversation. It is important to

mention that there have been a number of studies that have used eye-tracking methods to measure attention in face-to-face SA (Buckner, Maner, & Schmidt, 2010; Gamble & Rapee, 2010; Schofield, Johnson, Inhoff, & Coles, 2012), with research identifying that individuals with SAD have a tendency to avert their eye gaze away from faces when engaging in a conversation (Baker & Edelmann, 2002). A novel contribution of Vriends and colleagues (2017) study is that they explored both SFA and eye-tracked attention within a social interaction.

Specifically, Vriends and colleagues (2017) asked female participants to engage in an eight-minute video conversation with an attractive male confederate, with participants observing both the conversation partner and a video of themselves (which was present during the entire conversation). The sample included women with HSA (n=29) versus LSA (n=29; Experiment one) and women with SAD (n=32) versus a control group (n=30; Experiment two). The authors' excluded males because of research which has discovered that gender mediates the relationship between SFA and SA (Mansell et al., 2003; Vriends et al., 2016). The participants each engaged in a video conversation that had four phases of manipulated social stress; warm-up (introduced each other, asking neutral questions about work situation), positive (the confederate was friendly and gave the participant compliments), critical (the confederate made comments about negative characteristics of the participant) and active (the participant was invited to lead the conversation and direct the conversation). The findings demonstrated that individuals with SAD and HSA reported significantly higher levels of SFA than the LSA and control groups as measured by questionnaire measures. With regards to eye-tracking findings, the SAD group looked significantly more at the self-video image than the control group across all phases of the conversation, and this was associated with increased feelings of nervousness before the conversation and

decreased self-confidence after the conversation. It could be suggested that looking at the video lowered confidence and increased feelings or nervousness, alternatively these feelings may have precipitated shifts in attention to look at the video. Interestingly, the aforementioned pattern of eye movements was not identified in the HSA group; namely the HSA group did not look more at the self-video image in comparison to the LSA group. This pattern only surfaced when the confederate became critical. It is plausible that the criticism from the confederate amplified the fear of negative evaluation and individuals shifted their attention to monitor how they were coming across in the video, however, little is known about this prediction as this was not explored by the author's. Moreover, the authors did not explore whether participants found the self-video to be helpful or a hindrance, or whether SFA and visual attention is affected by its presence on screen.

In an unrelated study, Gershkovich (2015) investigated the effect of therapist support through video conferencing and noted 87.5% of participants with SAD in the therapist support group explained that they found video conferencing communication with a therapist helpful. However, the authors noted that some individuals provided qualitative feedback suggesting that they found the video interactions very anxiety provoking (e.g. "being on video was torture for me" p. 57). This feedback suggests that some individuals with SAD may find video conferencing anxiety provoking or unhelpful. However, it remains unknown what it was about the video interaction that participants found anxiety provoking or how they appraised their performance based on the feedback from the self-video.

1.7 Gaps in the Literature

Research exploring the maintenance mechanisms of SA in online interactions is in its' infancy. To illustrate this, there have been over 10,000 empirical articles on psychological aspects of Internet use, however only 40 published articles on the Internet and SA (Prizant-Passal et al., 2016). Moreover, the majority of research has been correlational in nature and has focused on text-based CMC, neglecting mediums that enable video or audio conversations. Employing an experimental design will allow for the exploration of a number of maintenance processes of SA within an online video interaction and for the consideration of the causal impact of viewing a video of oneself on components of the Clark and Wells (1995) model of SAD.

Vriends and colleagues (2017) established that individuals with HSA and SAD, self-reported higher levels of SFA after a conversation with a confederate and that there was variability in the degree to which individuals looked at the self-video. Additionally, Gershkovich and colleagues (2015) indicated that some participants with SAD found communicating over video conferencing software anxiety provoking. However, both studies neglected to explore how helpful participants found the self-video and how individuals perceived themselves when they looked at the video. Moreover, neither study manipulated the self-video (present versus absent) to investigate what effect this had on anxiety and other SA maintenance mechanisms. It seems pertinent to explore communications over video conferencing software, such as Skype, as evidence-based interventions for SAD are soon to be disseminated over this medium, yet little is known about the helpfulness of seeing a live video feed of the self or how highly socially anxious individuals engage with this communication.

The impact of mirror and video images on SA is far from clear-cut, with research demonstrating that showing individuals a mirror image of themselves increases SFA in

both those with HSA and LSA, yet its relationship to anxiety and other components of the Clark and Wells (1995) model is yet to be established. Vriends and colleagues (2017) explained that the self-video image may enhance SFA and could be utilised to confirm beliefs about how the individual believes they are coming across (e.g. see that their face going red). Alternatively, the self-video may be employed to correct negative self-images akin to video feedback (e.g. identifying that they 'feel' they are blushing, however 'seeing' that it is hardly visible).

Given that to the best of the author's knowledge, no research has specifically set out to explore the impact of having the self-video switched on or off during online video interactions; the current study seeks to investigate this further. The proposed study sets out to explore this during two 5-minute Skype conversations one with the self-video present on screen and one with the self-video absent. The conversation task will be a typical 'getting acquainted' conversation with no manipulations of social stress or restrictions upon what is discussed to facilitate the generalisability of the findings to everyday conversations. Specifically, the study will investigate whether individuals with HSA and LSA differ in their degree of anxiety, socially anxious thoughts, self-imagery, subjective ratings of performance and SFA as measured by self-report questionnaires during the video conversation. In addition, the aim is to examine whether the aforementioned factors differ when the self-video is present or absent. Moreover, in line with Vriends and colleagues (2017), visual attention will also be measured by an eye-tracker throughout the conversation. As this study is exploratory in nature, it will seek to gain qualitative feedback with regards to self-imagery participants experience during the conversation, along with feedback investigating how participants perceived themselves in the self-video.

1.8 Aims of the Current Research

In summary, the first main research question is to explore whether the same cognitive-behavioural processes that maintain SA in face-to-face situations exist during online video conversations. This question generated the following hypothesis; Individuals with HSA will report heightened SFA, greater anxiety, more socially anxious thoughts, poorer self-evaluations of performance and more vivid self-imagery from an external-observer perspective compared to individuals with LSA.

The second main research question sets out to investigate if viewing a video of oneself whilst having a Skype interaction is beneficial or not. Given that mirror manipulations induce SFA in those with HSA and LSA (Bögels et al., 2002; Bolt et al., 2014), it is hypothesised that both individuals with HSA and LSA will experience greater levels of SFA in the condition when they observe the live video of themselves. Due to the mixed findings regarding the effect of looking at oneself in mirrors and video recordings on other aspects of SA, no directional hypothesis will be stated for the effect of manipulating the presence of the self-video on anxiety, socially anxious thoughts, self-performance ratings and self-imagery. Owing to the exploratory nature of this question qualitative feedback will also be sought to develop a richer understanding with respect the self-imagery participants experience during the video conversations and how they perceive themselves in the self-video.

The third question concerns eye-tracked visual attention. Given that there is limited research on eye-tracked visual attention during online video interactions, the study will explore whether the duration of time fixated on the conversation partner's face will differ based on the conversation conditions (self-video present versus absent) and between SA groups. In addition, a comparison of time spent fixating on the self-video between the SA groups will be investigated.

METHOD

2.1 Overview of Method Chapter

This chapter will begin with an overview of the screening phase, followed by details of the main study. Each phase will incorporate descriptions of the design, measures and apparatus utilised within the study. Details of participant characteristics will be presented alongside a comprehensive account of the experimental procedure. Finally, ethical considerations raised in the study will be discussed.

2.2 Screening Stage

2.2.1 Screening design

A cross-sectional design was implemented during the screening process. A questionnaire was created on Qualtrics (Version, 2016) survey software platform and included three self-report measures: Patient Health Questionnaire (PHQ-9), Brief Fear of Negative Evaluation Scale (BFNES) and The Albany Panic and Phobia Questionnaire Social Phobia Subscale (APPQSPS). On the basis of BFNES and APPQSPS scores, participants were assigned to one of two experimental groups: high social anxiety (HSA) or low social anxiety (LSA). See section 2.2.3.5 for grouping criteria.

2.2.2 Screening participants

A community sample of students were recruited via opportunistic sampling methods at Royal Holloway, University of London (RHUL). Participants were sought via the distribution of poster advertisements around the RHUL campus and individual departments were contacted to display the advertisement on departmental message

boards. In addition, online advertisements were displayed on university Facebook groups and online university message boards. Furthermore, the study was listed on an online experimental management system run by the Psychology Department. This system promotes research participation opportunities to a pool of students who have expressed interest in taking part in research for payment or entry to a prize draw. Online and paper advertisements directed potential participants to the Qualtrics screening survey or to a Facebook page containing a hyperlink to the survey, thus allowing instantaneous access. Entry into a prize draw to win one of four £15 Amazon vouchers was offered to all participants who completed the screening survey. Participants who were eligible to complete the main study were told that they would be reimbursed £5 for 30 minutes of their time at the RHUL Psychology Department. The aim was to provide an incentive to participate in the main study.

2.2.2.1 Power analysis

At the point of designing the study, no research had examined how SA presents on Skype and so we were unable to base the power analysis on data from a previous study that utilised a similar methodology. Instead, we used an a priori power analysis to estimate the most conservative sample size (Faul, Erdfelder, Lang, & Buchner, 2007). The calculation indicated that a total sample size of N=76 will be necessary for a two-way mixed-model ANOVA to ensure there is sufficient power and to minimise the probability of making a Type II error. The power analysis was calculated using an effect size of 0.25 (medium effect), the statistical power of 0.95 and a significance level of 0.05. Thus, the aim was to recruit 38 for each SA group. The actual sample obtained was 40 in the HSA group and 33 in the LSA group, however two individuals in the

HSA group were unable to complete the main study questionnaires (see Section 3.2.1). The current study was slightly underpowered, with an actual power of 0.76.

Ryan and colleagues (in prep) study was used to predict the number of participants that needed to be screened to achieve the required sample size. This study was chosen because it employed the same SA screening measures to allocate a student sample to either a HSA or LSA group. In their study, 29% of the 430 participants met cut off scores on the BFNES and the APPQSPS. In line with this ratio, we predicted that 262 participants would need to be screened in the current study to achieve the proposed sample size. The actual screening sample in the current study was 333.

2.2.3 Screening Measures

All participants taking part in the screening survey were asked to complete the below measures via a five-minute online survey. The measures described below are self-report scales, originally published as paper-and-pencil questionnaires. For the purposes of this study, the measures were recreated in an online format using the survey formation software, Qualtrics.

2.2.3.1 Demographic information

Participants provided information regarding basic demographic characteristics including age, gender and ethnicity.

2.2.3.2 Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002)

The PHQ-9 is a 9-item self-report questionnaire that assesses symptoms of depression. Ratings of each item are made on a 4-point Likert scale, from 0 (Not at all) to 3 (Nearly everyday). Total scores range from 0 to 27, with higher scores indicating greater levels of depression. The questionnaire includes 'item 9' that assesses the

presence of suicidal ideation: "Thought that you would be better off dead or of hurting yourself in some way". Examples of other items include: "Little interest or pleasure in doing things" and "Feeling bad about yourself or that you are a failure or have let yourself or your family down". The questionnaire has good test re-test reliability and internal consistency (Cronbach α=.89; Kroenke, Spitzer & Williams, 2001). In the present study, the questionnaire demonstrated good internal consistency (α=.86). A copy of the PHQ-9 can be found in Appendix A.

2.2.3.3 Brief Fear of Negative Evaluation Scale (BFNES; Leary, 1983)

The BFNES is a 12-item self-report measure that assesses the fear of negative evaluation from others. Ratings of each item are made on a 5-point Likert scale, from 1 (Not at all characteristic of me) to 5 (Extremely characteristic of me). Examples of items on the scale include: "I worry about what other people will think of me even when I know it doesn't make any difference" and "I often worry that I will say or do the wrong things". The scale also includes four reverse-scored items, examples of reverse-scored items on the scale include: "I am unconcerned even if I know people are forming an unfavourable impression of me" and "If I know someone is judging me, it has little effect on me'. The BFNES generates a total score between 12 and 60, where a higher score indicates greater fear of negative evaluation. The BFNES has demonstrated excellent internal validity (α=.90), excellent inter-item reliability (r=.94) and acceptable test-retest reliability (r= .74; Leary, 1983). In the present study, the subscale demonstrated excellent internal consistency, (α=.91). A copy of the BFNES can be found in Appendix B.

2.2.3.4 Albany Panic and Phobia Questionnaire Social Phobia Subscale (APPQSPS; Rapee, Craske & Barlow, 1994)

The APPQSPS is a 10-item subscale that assesses the degree of fear of social situations. The scale is taken from the 21-item Albany Panic and Phobia self-report questionnaire, which measures the level of fear associated with a range of situations. Ratings of each item on the APPQSPS are made on an 9-point Likert scale, from 0 (No Fear) to 8 (Extreme Fear). Examples of items on the scale include: "Introducing yourself to groups", "Writing in front of others" and "Giving a speech". The APPQSPS generates a score between 0 and 80, with higher scores demonstrating a greater fear of social situations. The scale has demonstrated excellent internal consistency (α=.91) and good test re-test reliability (r=.84; Rapee et al., 1994). In the present study, the subscale demonstrated good internal consistency, (α=.89). A copy of the APPQSPS can be found in Appendix C.

2.2.3.5 Screening survey scoring

Algorithms were generated using Qualtrics survey software to automatically calculate scores on the BFNES and APPQSPS screening measures and guide participants to the necessary inclusion or exclusion webpages. The use of the BFNES to identify high and low socially anxious individuals is well recognised in SA research (Stopa & Clark, 2001). The predetermined high and low ranges on the BFNES were in line with the cut-offs employed by Garner, Mogg, and Bradley (2006) who included the top 35% and bottom 30% of a UK student population. Participants scoring equal to or less than 30 were considered to be 'low' in SA and those scoring equal to or greater than 40 were considered to be 'high' in SA. However, for participants to be included in either the HSA or LSA group, they were required to also meet criteria on the APPQSPS.

The APPQSPS has been used alongside the BFNES in previous research to ensure that fear of negative evaluation is specifically associated with a fear of social situations (Bolt, Ehlers & Clark, 2014). The present study employed the same high and low ranges on the APPQSPS as Bolt and colleagues (2014): participants scoring 19 and above were deemed high in fear of social situations, with 19 being one standard deviation below the mean of an SAD population (Rapee et al., 1994). The low range was indicated by a score of 16 or below, which represents the bottom 25% of a general population distribution (Bolt et al. 2014).

In summary, participants met the criteria for HSA group if they scored 19 or above on the APPQSPS (Rapee et al., 1994) and scored respectively 40 or above on the BFNES (Leary, 1983). Conversely, participants met the criteria for the LSA group if they scored 16 or below on the APPQSPS (Rapee et al., 1994) as well as 30 or below on the BFNES (Leary, 1983). Those who scored in the mid-range were automatically directed through to an online debrief sheet page (see Appendix E), and subsequently emailed a copy for their records.

2.2.3.7 Piloting of online screening survey

Before launching the online screening survey, it was piloted amongst colleagues at RHUL. The volunteers were asked to provide specific feedback regarding the functionality of the software. Through this process it was discovered that some of the question formats were not compatible with smart phones and so this was adapted to ensure it could be viewed on smart phones, iPads, Macs and PC'S. Further alterations were made to adjust the sequence of questions.

2.2.4 Screening procedure

Participants accessed the online screening survey through a web address, which enabled multiple participants to complete the standardised questionnaires through the Qualtrics survey platform at any one time. Once the webpage had been accessed, participants were required to read through the information sheet (See Appendix D) and click through to the next page to consent to take part in the study. Following this, they were invited to complete demographic information and the PHQ-9 questionnaire. In addition, they were asked to indicate whether they were taking medication for psychological difficulties.

Participants who met the initial criteria to take part in the survey were then presented with two self-report measures in turn: the BFNES and the APPQSPS. A brief description of the measure was included at the top followed by the questionnaire items with respective scales. A progress bar was displayed to allow participants to monitor the stage of completion. In addition, pop-up windows alerted participants if they missed any questions and were 'requested to respond' when they pressed 'next' to take them through to the subsequent page. Missed questions were highlighted to ensure that participants were made aware they had not completed a particular question; however, they were not required to complete the questions to proceed and so were able to intentionally skip if they so wished.

Based on the scores on the measures, participants were taken to one of two debrief webpages: (1) Participants scoring high or low in SA were presented with a debrief sheet and an invitation to take part in the main study (see Appendix F), along with prize draw information. Qualtrics automatically assigned each participant with a unique identifier number, which was used to identify participants in the main study

rather than their name. (2) Participants who completed the BFNES and APPQSPS but did not meet the inclusion criteria for either the high or low SA group were presented with a debrief sheet with support numbers and prize draw invitation (See Appendix E).

Each screening participant was given the option to provide an email address to be entered into a prize draw. Participant email addresses were stored separately from their initial response set to ensure that no identifiable information was associated with their scores on the screening questionnaires. All participants who provided their emails were emailed with a copy of the debrief sheet for their records.

2.3 Main Study

2.3.1 Design

As outlined in Figure 2 below, the study utilised both a cross-sectional (screening phase) and experimental design (main study phase). For the main study, a 2x2 mixed model design was employed with the first factor being a between-subjects variable (HSA versus LSA). The second factor was a within-subjects variable (self-video present versus self-video absent). The dependent variables that were measured through self-report questionnaires were socially anxious thoughts, anxiety, self-imagery, self-evaluation of performance and SFA. Eye-tracked visual attention was also measured throughout the conversation using an eye-tracking device to identify the percentage of fixations on the self-video and the percentage of fixations on the confederate's face, compared to anywhere else on the screen. Participants were invited to engage in two Skype conversations, one with a video of themselves turned on (self-video present) and the other with the video of themselves turned off (self-video absent). The order of conditions were counterbalanced to avoid order effects.

2.3.1.2 Statistical design

All quantitative data was analysed using the Statistical Package for Social sciences (SPSS, Version 21.0). Two-way mixed model ANOVAs and its variants were utilised for analyses, with the between-subjects factor SA group (HSA versus LSA) and the within-subjects factor conversation condition (self-video present versus self-video absent) to investigate the main effects of the self-video and SA group on the following variables: socially anxious thoughts, anxiety, self-evaluation of performance, self-imagery, SFA and the percentage fixation duration on conversation partner's face. The interaction between SA group and conversation condition was also investigated. Differences between the HSA and LSA groups on the percentage fixation duration on the self-video and quantitative ratings concerning how helpful participants found the video were analysed using independent sample *t*-tests.

The limited amount of qualitative data gathered, which explored how participants perceived themselves in the self-video and the self-imagery experienced, was analysed using content analysis to identify themes. Content analysis was chosen to analyse the data, as it combines both quantitative and qualitative methods (Bengtsson, 2016). An open coding process was employed allowing for the coding of meaning units, which are defined as groups of words that relate to the aims of the research (Berg & Lune, 2013). The codes in the study were identified through reviewing participants' statements in order to identify themes. During this process, research exploring the central tenets of SA was consulted to support the theoretical basis of the identified codes. The meaning units were grouped into sub-themes and subsequently to themes, which were then counted. A doctoral level trainee clinical psychologist, who was blind to the study's aims, independently coded all the qualitative data to estimate inter-rater reliability. The agreement between coders was κ. = .865 (95% CI, 0.336 to 1.394),

p<.001, suggesting good inter-rater reliability. There were 18 discrepant codes between the two-raters. Following the independent ratings each discrepancy was discussed and a final code was agreed upon.

Online Screening Questionnaire   **Main Study**

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                                           ┌─────────────────────┐
                                           │ Video Self Present  │      ┌──────────────┐
                                  ┌──────┐  └─────────────────────┘      │    Counter   │
                                  │ High │                               │   Balanced   │
┌──────────────────────┐         └──────┘  ┌─────────────────────┐      └──────────────┘
│  Screening Measures   │                  │  Video Self Absent  │
│        PHQ-9          │                  └─────────────────────┘
│       APPQSPS         │
│        BFNES          │                  ┌─────────────────────┐
└──────────────────────┘                  │ Video Self Present  │      ┌──────────────┐
           │                     ┌──────┐  └─────────────────────┘      │    Counter   │
           ▼                     │ Low  │                               │   Balanced   │
┌──────────────────────┐        └──────┘  ┌─────────────────────┐      └──────────────┘
│       Excluded        │                  │  Video Self Absent  │
└──────────────────────┘                  └─────────────────────┘
```
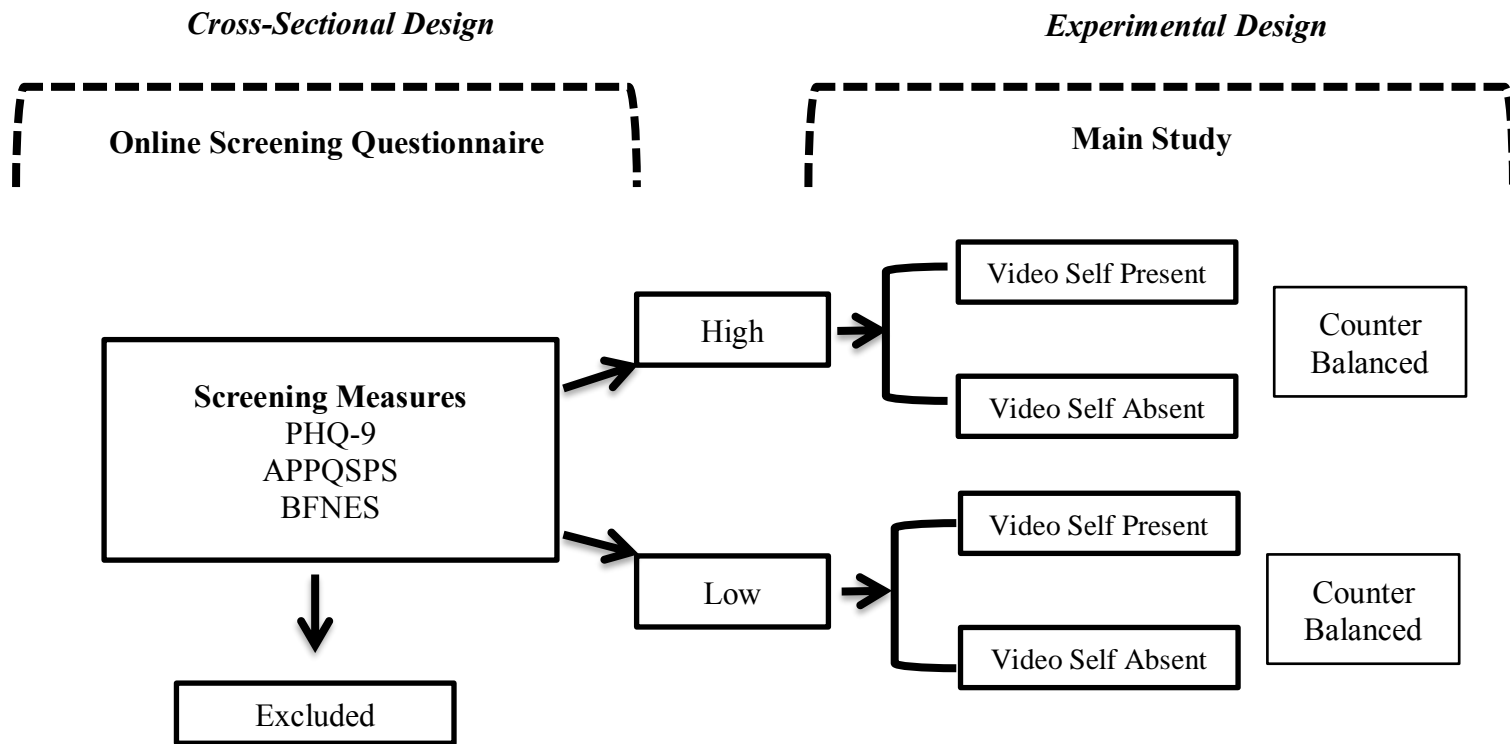
Figure 2: Overview of design.

2.3.2 Participants

A total of 333 participants completed the screening survey, 60 individuals were excluded before they could complete the SA measures because they were experiencing suicidal ideation (n=41) or taking psychotropic medication for psychological difficulties (n=19); of these 60 there were 10 individuals who were concurrently experiencing suicidal ideation and taking psychotropic medication. Overall, 258 participants completed the SA measures, with 125 individuals meeting the criteria. Of the 125 that were invited to take part, 73 agreed to take part. Figure 3 presents the number of individuals at each stage of the study.

2.3.2.1 Exclusion criteria

On the PHQ-9, participants who scored either 'Several Days; More Than Half the Days; Nearly Everyday' on question 9 'Thoughts that you be better off dead or hurting yourself in some way' were taken to an exit message and presented with a web page signposting them to support numbers. The webpage encouraged participants to seek support from their GP, the university counselling service or if there were experiencing more immediate concerns, they were advised to present at their local Accident and Emergency department. Those taking psychotropic medication for psychological difficulties were also excluded and not required to fill out the SA measures. As such, they were automatically directed to a debrief page presenting the researcher's contact information along with signposts to the previously mentioned support numbers. All participants were given the opportunity to submit their contact details to be entered into the prize draw, this was through a separate survey page to ensure participant contact details were stored separately to their responses. Every participant who provided an email address was emailed a copy of the debrief sheet for

their records. Appendix E shows the debrief sheet presented to individuals who were

excluded from the main study and Appendix F demonstrates the debrief sheet presented

to individuals who met criteria to participate in the main study.

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                              ┌─────────────────────────┐
                              │ 333 Participants Completed │
                              │      the Survey          │
                              └─────────────────────────┘
┌─────────────────────────┐                                    ┌─────────────────────────┐
│ 15 partially completed Social │ ◀ · · · · · · · · · · · · ▶ │ 41 Excluded for PHQ-9    │
│ Anxiety Screening Measures │                                │ 19 for Psychotropic Medication │
└─────────────────────────┘                                    └─────────────────────────┘
                              ┌─────────────────────────┐
                              │ 258 Completed the Social │
                              │ Anxiety Screening Measures │
                              └─────────────────────────┘
┌─────────────────────────┐
│ 133 Excluded for scoring │ ◀ · · · · · · · · · · · ·
│      mid-range           │
└─────────────────────────┘
```

┌──────────────────────────────┐   ┌──────────────────────────────┐
│ 62 Included for scoring   │   │ 63 Included for scoring   │
│ low in social anxiety (LSA)   │   │ high in social anxiety (HSA)   │
└──────────────────────────────┘   └──────────────────────────────┘

┌──────────────┐ ┌──────────────┐   ┌──────────────┐ ┌──────────────┐
│ 29 LSA   │ │ 33 LSA   │   │ 23 HSA   │ │ 40 HSA   │
│ did not participate │ participated in the │ did not participate │ participated in │
│ in the Main Study │ Main Study   │   │ in the Main Study │ the Main Study │
└──────────────┘ └──────────────┘   └──────────────┘ └──────────────┘

Figure 3: Flow diagram of participants.

2.3.3 Measures

Each participant had two conversations, one with the video present and one with the video absent (order counterbalanced). Participants were asked to complete the following questionnaire measures at the end of each conversation on a laptop with pre-loaded links to the Qualtrics software survey platform.

2.3.3.1 Anxiety

2.3.3.1.1 Adapted Social Cognitions Questionnaire (SCQ; Wells et al., 1993)
The SCQ lists 22 common thoughts that individuals with SA may experience during social situations, such as, "I am unlikeable" or "I will babble or talk funny". The SCQ has been shown to have three factors: negative self-beliefs (e.g., "I am inadequate"), fear of performance failure (e.g., "I will be paralysed by fear") and fear of negative evaluation (e.g., "People will reject me"). The original questionnaire asks participants for the extent of the thought on a scale of 1 (Thought never occurs) to 5 (Thought always occurs). In the present study, the SCQ was adapted to measure the overall frequency of socially anxious cognitions participants experienced during the conversation (see Appendix G). Participants were asked to indicate either 'Yes' or 'No' as to whether they noticed having the thought during the conversation. The scores for the number of thoughts present were totalled to provide an overall frequency of socially anxious cognitions present per conversation. The SCQ full scale has been reported to have good test-retest reliability over a 4 to 6-week period (r=.79, p < .001, Tanner, Stopa & De Houwer, 2006).

2.3.3.1.2 Anxiety ratings

In line with the procedure suggested by Clark (2005), after each conversation, participants were asked to rate: How anxious they felt during the conversation, on a scale ranging from 0 (not at all anxious) to 100 (completely anxious). The questions can be found in Appendix H.

2.3.3.2 Self-perception

2.3.3.2.1 Subjective rating performance

To examine subjective ratings of performance, each participant was asked to rate how well they thought they came across to the other person during the conversation on a scale ranging from 0 (not very well at all) to 100 (very well). The questions can be found in Appendix H.

2.3.3.2.2 Self-perception in video

To the authors knowledge (conducting searches on PsycINFO, Pubmed, Medline) there have been no published questionnaires assessing how individuals with varying levels of SA perceive themselves in the self-video during an online conversation. Therefore, a number of questions were developed specifically for the purpose of this study to explore how individuals used the video when it was present (See Appendix I). Below are the questions included in the questionnaire, followed by a brief rationale for each:

Q1. On a scale of 0 (not at all) to 100 (very much), to what extent did you worry that you were being judged negatively because of the way you looked in the video? As identified during the screening process, the individuals taking part in the research

scored either high or low in fear of negative social evaluation. This question was aimed at exploring whether participants feared negative judgement based on what they had viewed during the video feed.

Q2. On a scale of 0 (not at all helpful) to 100 (extremely helpful), please evaluate how helpful it was to have the video of yourself present? This question was included to assess the perception of how useful individuals found the video.

Q3. Please describe any similarities or differences regarding how you thought you were coming across during the conversation compared to what you actually saw during the video? A qualitative question was added to gain a richer understanding of the image and nature of individuals' self-impression in the self-video. In addition, the aim was to explore the discrepancy between subjective beliefs about performance and how participants viewed themselves in the video.

2.3.3.2.3 Self-imagery

To investigate the perspective and content of images experienced during the conversation, three questions were adapted from standardised questions used in a semi-structured interview described by Hackmann, Surawy and Clark (1998). The questions included in the present study were selected because of specific relevance to the study's aims. The questions were piloted prior to the commencement of data collection with colleagues at RHUL and were reformatted to be included in the online survey.

Participants were first requested to recall the conversation that they just engaged in and provide qualitative material on any images or pictures they experienced, specifically participants were invited to evoke the image and to describe what the

image/picture looked like. They were then asked to rate the intensity of this image on a scale of 0 (no image/picture) to 100 (an extremely clear image or picture), and indicate whether the dominant perspective of the image was 'one of viewing the situation as if looking through *their* eyes observing what was going around *them*' (field perspective) or 'one in which *they* were observing the self, looking at the self from an external point of view' (observer perspective; Hackmann et al., 1998). The self-imagery questions can be found in Appendix J.

2.3.3.3 Self-focused attention

2.3.3.3.1 Focus of Attention Questionnaire Self-Focus Subscale (FAQSFS; Woody, Chambless & Glass, 1997)

The FAQSFS is a 5-item self-report scale used to measure the extent to which individuals' attention is directed towards the self. Ratings of each item are made on a 5-point Likert scale, 1 (Not at all) to 5 (Totally). Four of the items address self-focus on internal process: "I was focusing on what I would say or do next", "I was focusing on my level of anxiety", "I was focusing on my internal bodily reactions" and "I was focusing on my past social failures". One of the items address focus of attention directed to the participant's own performance "I was focusing on the impression I was making on the other person". The FAQSFS generates a total score between 5 and 25, with higher scores indicating greater SFA. The self-focus subscale has demonstrated adequate internal consistency (α=.76) and construct validity (α=.72; Woody, Chambless & Glass, 1997). In the present study, the subscale demonstrated acceptable internal consistency, (α =.78). A copy of the FAQSFS can be found in Appendix K.

2.3.3.3.2. Self-focus rating scale

Participants were asked to rate how self-focused they thought they were throughout the conversation on a scale ranging from 0 (I was totally externally focused

on my conversation partner and my surroundings) to 100 (I was totally focused on myself during the conversation). A copy of the scale can be found in Appendix L.

2.3.3.4 Visual attention

Eye tracking was conducted using a remote eye-tracking system allowing for a direct yet non-invasive measure of visual attention. A Tobii x120 eye-tracking system with a sampling rate of 60Hz was employed to record participant's direction of visual attention as they engaged in the Skype conversations. Before each conversation, the participants undertook a 9-point calibration process, with eye-gaze fixations required to be within each calibration dot to establish confidence that the system would track fixations across the screen. During the conversation, a fixation was classified as an eye movement that lasted for a minimum of 1000ms, within a $1°$ visual angle.

Fixations directed to anywhere on the screen were captured, however subsequent to each conversation Tobii Studio software was used to define standardised 3 specific areas of interest (AOI); the video of the self, the face of the confederate and the whole screen. The lead researcher inserted three outlines to each video conversation recording, which were of standardised size (an oval on the conversation partner's face, a rectangle on the self-video and a rectangle over the whole screen) to identify each AOI (See Figure 4). The areas of interest were activated from the point that the lead researcher left the room and the conversation began, and were deactivated after five minutes. The outline of the AOI for the conversation partner's face was manually shifted to ensure that fixations on the face were captured as and when slight movements were made. Figure 4 demonstrates a picture of two example screens; the AOI for self-video and the AOI for the confederate's face. The self-video was always positioned on the bottom right hand section of the screen to allow for an unobstructed view of the

confederate's face.

The present study investigated total fixation durations on the confederate's face and the total fixation durations on the self-video during each five-minute conversation. To account for some individuals naturally shifting their eyes away from the screen while they engaged in the conversation, the percentage of time the participant fixated on the self-video relative to the total duration of fixations towards the whole screen was calculated per conversation. Similarly, the percentage of time the participant fixated on the confederate's face in comparison to the total duration of fixations to the whole screen was calculated per conversation. This was in line with a procedure implemented by Vriends and colleagues (2017).
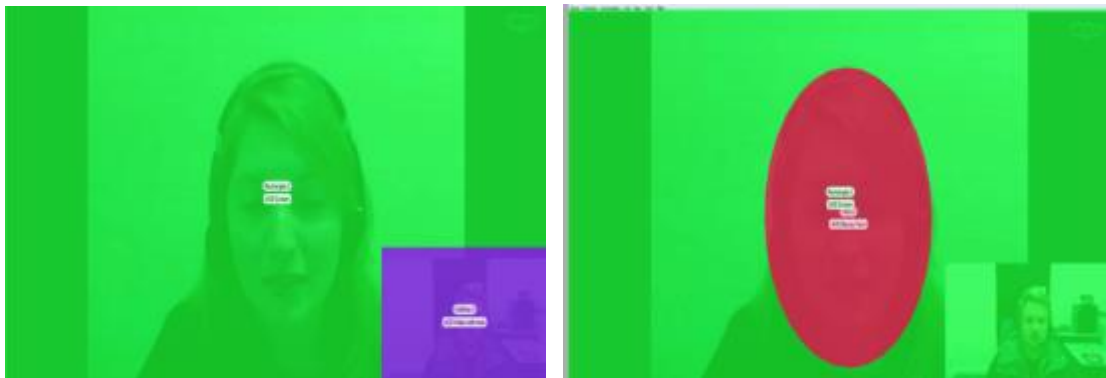
Figure 4: Selecting areas of interest (AOI) for the self-video and confederate's face.

2.3.4 Apparatus

2.3.4.1 Eye-tracking equipment

The Tobii x120 eye-tracking system has a remote screen-based eye-tracker positioned below the screen. The eye tracker was set-up in the lab at 35° gaze angle, with a fixed chair enabling participants to sit 70cm away in order to capture the entire area of fixation.

2.3.4.2 Computer set-up

A two-computer arrangement was employed within the study. The Tobii x120 computer system, which was isolated from the Internet, was utilised solely for the purpose of the tracking and recording of eye-movements. An adjacent computer was set-up to run Skype. This allowed for the eye tracking system to record eye movements in the background while the participant engaged in the Skype conversation. Figure 5 demonstrates the computer set-up. Both processors were connected through a Digital Visual Interface (DVI) cable, thus enabling the primary screen, which can be seen at the centre of Figure 5, to be used for both the eye-tracking video and the Skype conversation. The second screen, which is displayed on the right-hand side of the image, was switched off during the conversation to prevent distraction. Following the eye-tracking calibration, the experimenter clicked a button on the dual graphics card to switch the screens. Thus, allowing for the recording of eye movements to be run in the background whilst the Skype conversation was shown to participants.

Figure 5: Experimental set-up: Computer arrangement; on the left Tobii X120, on the right Windows for Internet access.

2.3.4.3 Participant room

A number of pieces of equipment were used in the main study: two computer desktops and processors, one laptop, one headset with a microphone and a webcam (see Figure 6). As mentioned previously, the two computers were employed to run the Skype conversation and Tobii eye-tracking software. A laptop was set-up for participants to complete information sheets and the main study questionnaires. Moreover, a Microsoft HD-300 webcam was mounted on the top of the primary desktop screen, to enable the Skype video feed and the headset to enable audio communication.
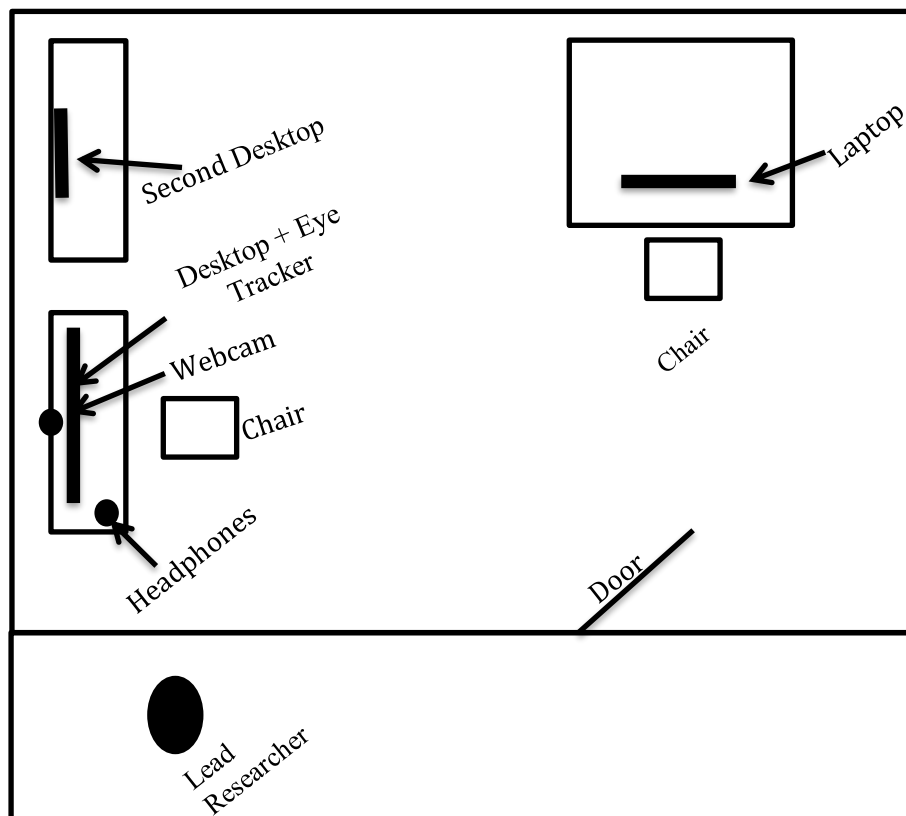
Figure 6: Experimental set-up: participant room.

2.3.4.4 Experimental set-up: confederate room

The confederate was positioned in a separate room, which was on another floor within the same building (see Figure 7). It is important to note that both the confederate and the participant sat in front of a blank wall, to minimise distractions. Equipment in the confederate's room included a desktop PC, a Microsoft HD-300 webcam and a headset with microphone analogous to the model worn by the participant. The confederate sat approximately 70cm away from the monitor and was advised to broadly keep her face in the middle of the screen to allow for the analysis of fixations directed towards her face. The confederate was blind to the aims of the study, the participant group and the video present versus absent conditions.
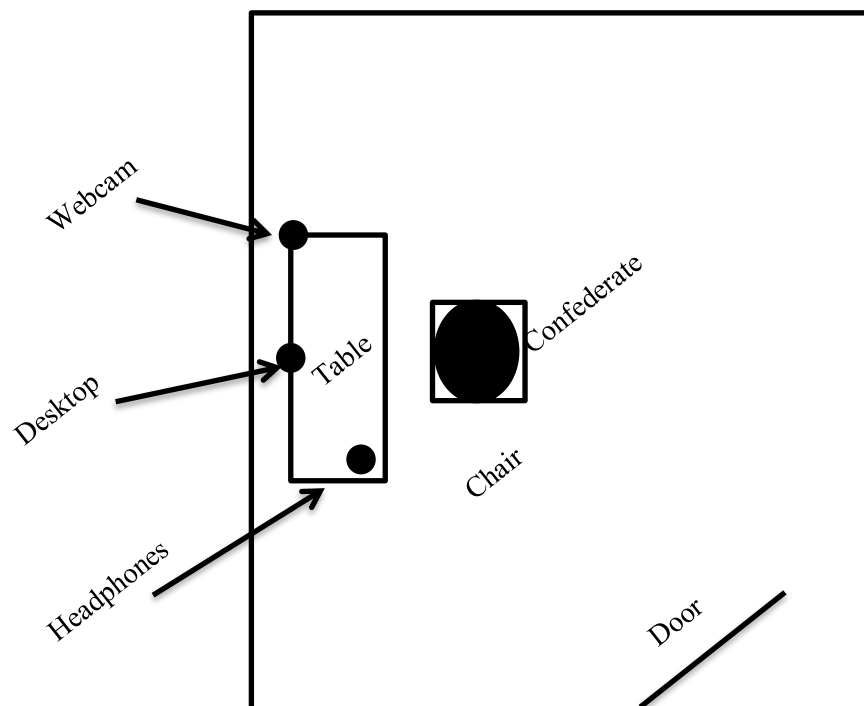
Figure 7: Experimental set-up: confederate room.

2.3.5 Procedure

2.3.5.1 Piloting of the main study task

Prior to data collection in the main study, the procedure was piloted with three volunteer students at RHUL. Two of the three volunteers met criteria to be included in the HSA group. The piloting procedure enabled the primary researcher to trial the set-up of the equipment and to practice operating the software used in the main study. A detailed procedure was developed based on the feedback provided by the volunteers about the sequence of events, as well as specific comments about the wording of instructions. A key task in the piloting process was to develop questions scoping out how participants engage with the video of the self when it was present during the conversation. The questions were developed based on their feedback of how they experienced the video, for example used the video to monitor how they are coming across during the conversation. See section 2.3.3.2.2 for details of the questions.

2.3.5.2 Piloting of the conversation task

The conversation was piloted with the same three volunteer students. To begin with, a set of generic questions for the confederate to ask were identified (e.g. have they been on a recent holiday). Feedback from the volunteers involved in the piloting process indicated that the conversation felt artificial and did not flow well. The research team decided to review the pilot conversations and thought together about how the confederate could facilitate the conversations by asking open questions concentrated on general topics and responding with an attentive and friendly posture. To practice, the primary researcher and the confederate engaged in a number of mock Skype conversations to practice developing a more relaxed style. The confederate was blind to the aims of the study, the participant groups and the conversation conditions. The

confederate was provided a copy of the information sheet (see Appendix M) that was given to participants and was told that the aim of the study was to explore the impact of personality differences on online interactions.

2.3.5.3 Main study procedure

The lead researcher greeted each participant and invited him or her to enter the main study room. The lead researcher presented each participant with a piece of paper with a unique participant number that was randomly allocated by Qualtrics during the screening process. Participants were guided to a laptop with the pre-loaded main study information sheet and consent form on Qualtrics. They were then requested to read the information sheet and, if they wished to continue, fill in the consent form (see Appendix M). Next, participants indicated to the lead researcher that they had completed the electronic forms and were invited to sit in front of the desktop computer with the eye tracking hardware. The lead researcher opened the Tobii eye tracking software and set up the eye tracking calibration process. This involved participants gazing at 9-point calibration process on the screen. Once it was deemed that gaze quality was in each calibration dot, the lead researcher entered the unique participant number that individuals were allocated during the screening process and set up the recording of the screen. The experimenter clicked the button on the dual graphics card to switch the screen with the processor that enabled the Skype conversation.

Then, the Skype application was opened, which had already been pre-set by the experimenter to have either the video of the self present or absent, whilst the participant completed questionnaires on the laptop across the room. Participants were asked to not alter any settings within each conversation and so the keyboard, and mouse were placed to one side. As mentioned previously, the order of the video conditions was

counterbalanced to prevent order effects. Half of all participants were exposed to version 1 (self-video present in the first conversation) and half were exposed to version 2 (self-video present in the second conversation). See Figure 8 for a display of what the screen looked like during a conversation with the self-video present versus a conversation with the self-video absent.
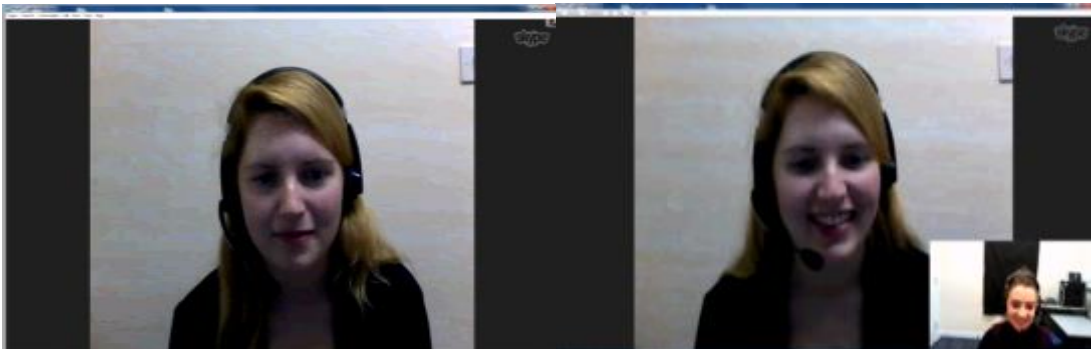
Figure 8: Experimental set-up: Skype conversation; on the left with self-video absent, on the right self-video present.

The following instructions were given to the participant before launching the Skype call: *'I will leave you to have a short conversation together and I will come back in five minutes. I know it may seem like a bit of an artificial environment, but I want you to try and have a conversation with your fellow student as if you were meeting them for the first time on campus, say in a coffee shop. Why don't you start by focusing on where you both live or where you are from? Feel free to take the conversation where you like and go off-topic. The conversation partner has the same instructions. If you don't have any questions then I will leave you to it'*

The participants had a five-minute conversation with the same female confederate, who spoke with every participant. After five minutes, the lead researcher entered the room to stop the conversation and the eye-tracking process. The participant

was then invited to sit at the desk with the laptop and complete the main study questionnaires, which were pre-loaded via Qualtrics. Participants were left alone to complete the main study questionnaires and were asked to let the lead researcher know when they had completed them. The aforementioned procedure was re-run with the counterbalanced self-video present or absent, depending on conversation order. The lead researcher prepared the self-video arrangement (present or absent) for the next conversation as the previous Skype call was exited. Following the completion of the two conversations and sets of questionnaires, participants were fully debriefed about the aims of the study and were asked to consent to the storage of their recordings in password-protected files. In addition, they were invited to consent for their videos to be used when explaining the study's findings, should the opportunity arise (see Appendix N). There was an opportunity to ask the lead researcher questions and participants were given contact details to the research team if they wished to discuss any aspect of the project further. A flow diagram of the study procedure is displayed in Figure 9.
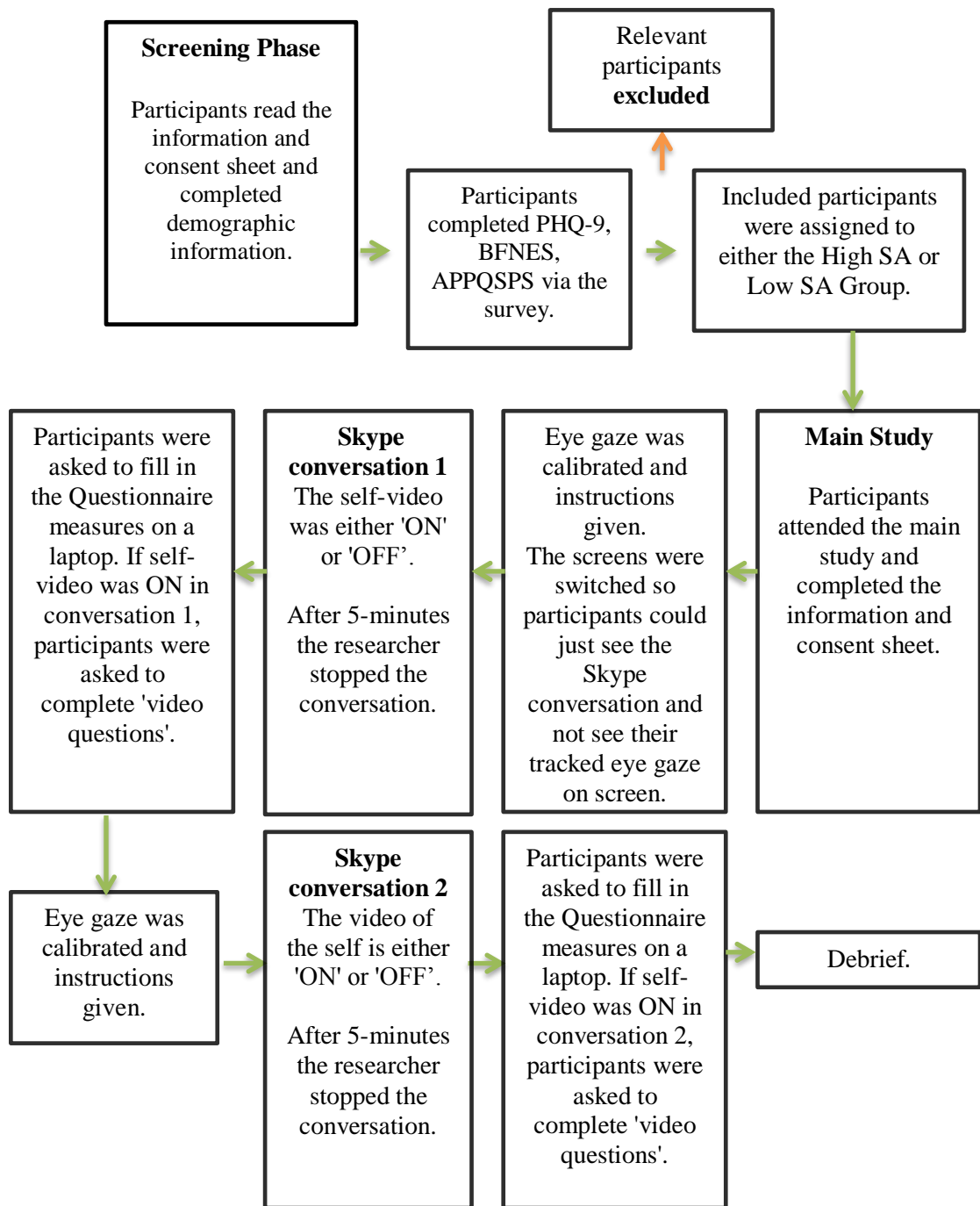
Figure 9: The overall procedure.

2.4 Ethical Considerations

The study obtained ethical approval following the RHUL research ethics procedures. A copy of the ethics form can be found in Appendix O. NHS ethics was not sought because recruitment did not take place in any clinical setting. The study addressed the subject of informed consent, the right to withdraw and full debriefing during each phase. At the start of both the screening survey and the main study, participants were presented with an information sheet on Qualtrics followed by a page with tick checkboxes to provide consent to take part (see Appendix D & M, respectively). The information sheets clearly indicated that participants could withdraw at any point without giving a reason and were able to skip any questions they did not wish to complete whilst progressing through the study. To ensure that consent was as 'informed' as possible, at the end of the screening survey participants who met the criteria for the main study were presented with a second information sheet explaining what the main study involved and then asked to input their email to consent for contact. All participants were fully debriefed at the end of the screening survey and were given the contact details of the lead researcher and primary supervisor (see Appendix E & F). Similarly, at the end of the main study participants were fully debriefed about the aims and were given the opportunity to ask the lead researcher questions (see Appendix N). During the study, participants were informed that they would be identified solely by a 4-digit number sequence randomly generated by the Qualtrics survey system and their data would be stored in password-protected files.

The degree of deception implemented within the study was minimal, the participants were informed that the confederate was a fellow student and was blind to the study aims, however she was the conversation partner speaking with every

participant during the study task. During the ethics self-assessment process, it was identified that the Skype conversation may induce anxiety, especially in those experiencing high levels of SA. Nevertheless, the conversations were considered to be on par with typical everyday conversations and so would not be expected to elicit distress above typical interactions with other students on campus. Despite this, participants were informed that if they became upset during the study they could contact and speak to the lead researchers at any point during the main study and their email addresses were clearly displayed on the online survey. As mentioned previously, participants experiencing suicidal ideation were automatically presented with a web page signposting to relevant support services.

RESULTS

3.1 Overview of Results Chapter

3.1.1 Quantitative data

The chapter begins with an outline of the statistical procedures that were implemented to prepare the data for analysis. In instances where parametric assumptions were violated, which is detailed within Section 3.2, variables were subject to statistical transformations. It is important to note that assumptions for parametric testing were met unless otherwise stated in the text. Subsequent to the data-screening phase, preliminary data analyses were conducted to explore socio-demographic characteristics of the sample and to assess differences between groups on screening variables. An overview of the analysis strategies implemented to examine the study hypotheses will be presented, followed by the outcomes of each statistical test. All quantitative analyses were performed using the Statistical Package for Social Sciences (SPSS, Version 21.0).

3.2 Preliminary Statistical Procedures

Exploratory data screening for potential errors, missing values and outliers was conducted, along with the assessment of the normality of the distribution for each of the present study's variables of interest.

3.2.1 Missing data

A total of 73 participants (n=33 LSA group and n=40 HSA group) consented to take part in the main study. One participant, who was included in the HSA group, could not complete the second set of study questionnaires because of a nationwide technical fault on the Qualtrics survey platform. A second participant in the HSA group had difficulty understanding questions due to English being a second language and so was

unable to fully complete the main study questionnaires. The aforementioned cases were excluded from the main analyses, resulting in n=38 participants in the HSA group and n=33 participants in the LSA group.

Screening of the eye-tracking data revealed that in some instances participants' eye-tracked data was not captured due to measurement errors, for example eyes being consistently out of range. For the fixations on the confederate's face there were n=2 missing for the LSA and n=5 for the HSA group, thus n=31 were included in the LSA and N=33 in the HSA group. For the fixations on the self-video n=1 was missing for the LSA group and n=4 missing for the HSA group, resulting in n=32 in the LSA and n=34 in the HSA were included in the analysis.

3.2.2 Outliers

In the present study, univariate outliers represented scores falling more than three standard deviations away from the mean. Outlying scores were first identified through surveying the box-plots for each variable and then compared to ensure they are more three standard deviations away from the mean. Before any action was taken, outliers were examined to ensure that they were genuinely unusual values and not part of measurement errors or data entry errors. A number of outliers were identified on both the questionnaire and eye-tracking scores, see Appendix P for a summary of outlying data points. The outliers were addressed through the process of winsorizing, which is the practice of replacing the outlying score with the value of the next score and balanced by correcting the most extreme score at the other end of the data distribution (Field, 2013). Rather than removing an extreme outlying score, winsorizing reduces the impact of the loss of power associated with removing scores from the dataset (Field, 2013).

3.2.3 Normality of distribution

Following the process of dealing with outliers, the distribution of each study variable was assessed visually by reviewing histograms with normal curves for each SA group separately. Subsequently, each of the variables were formally evaluated by calculating values of skew and kurtosis using the below formulae:

Skewness   Kurtosis

$$Z = \frac{S}{\text{s.e. skew}} \qquad\qquad Z = \sqrt{\frac{K}{\text{s.e. kurtosis}}}$$

Distributions were considered normal if (z<3.29 p>.001), thus a significant score on skew or kurtosis ($z > 3.29$, $p<.001$) highlighted a non-normal distribution. Unless otherwise stated below, variables across each group satisfied the aforementioned criteria for normality. The LSA group scores were positively skewed for anxiety ratings in both conversation conditions: when the self-video was present ($z=3.64$, $p<.001$) and absent ($z=4.70$, $p<.001$). As the variables were positively skewed a square root transformation was applied, which brought the distributions within normal bounds. To allow for comparisons across groups, anxiety ratings in the HSA group were also transformed (See Table 1 for Skew & Kurtosis following transformations).

The eye-tracking data also revealed that both the HSA and LSA eye-tracking scores were positively skewed on the percentage of fixation durations on the self-video ($z=5.35$, $p<.001$; $z=3.54$, $p<.001$, respectively). A square root transformation successfully normalised these distributions. Further, the LSA eye-tracking scores were negatively skewed on the percentage fixations on the confederate's face in the self-

video absent condition (z=-3.85 p<.001). As the percentage of fixations on the confederate's face was negatively skewed, the data was first converted to positive skew prior to a square root transformation and were reversed back to uphold the original direction of scoring. This process successfully normalised the distributions. To enable comparisons between groups, the same transformation was also conducted on the HSA group scores on the percentage fixations on the confederate's face in the self-video absent condition, and both SA groups in the self-video present condition. The resulting skew data for transformed variables all demonstrated normality (see Table 1).

Table 1: Skew data following transformations

Variable	Participant Group	Skew	Kurtosis
Anxiety Ratings (Self-Video Present)	LSA	0.99 (p > .01)	-0.27 (p > .01)
	HSA	-2.10 (p > .01)	1.01 (p > .01)
Anxiety Ratings (Self-Video Absent)	LSA	2.28 (p > .01)	1.29 (p > .01)
	HSA	0.26 (p > .01)	-0.75 (p > .01)
%Fixation Duration Face (Self-Video Present)	LSA	1.07 (p > .01)	1.01 (p > .01)
	HSA	2.21 (p > .01)	0.76 (p > .01)
%Fixation Duration Face (Self-Video Absent)	LSA	2.09 (p > .01)	0.91 (p > .01)
	HSA	0.94 (p > .01)	0.84 (p > .01)
%Fixation Duration on the Self-Video	LSA	1.37 (p > .01)	-2.00 (p > .01)
	HSA	3.26 (p > .001)	1.10 (p > .01)

3.3 Screening Phase

3.3.1 Total sample descriptive statistics

A total of 333 participants completed the demographic information in the online survey. Table 2 demonstrates the socio-demographic characteristics of the total sample who completed the screening survey.

Table 2: *Socio-demographic characteristics of screening sample*

Socio-demographic Variables		Total Screening (N, %) (N = 333)	Missing Values
Sex	Male	75(22.5%)	5 (1.5%)
	Female	253 (76.0%)	
Age (Years)	Mean (SD)	22.38 (5.32)	1 (0.3%)
	Range	18-56	
Ethnicity	White British	188 (56.5%)	
	White Other	45 (13.5%)	
	Black African	8 (2.4%)	
	Black Other	2 (0.6%)	
	Mixed Ethnicity	32 (9.6%)	
	Indian	10 (3.0%)	
	Chinese	17 (5.1%)	
	Other Asian	23 (6.9%)	
	Any Other Ethnicity	8 (2.4%)	

3.4 Main Study Phase

3.4.1 Main study participants descriptive statistics

Seventy-three participants took part in the main study. There were 33 and 40 participants in the low and high SA groups respectively (See Table 3 for Demographics). The groups did not differ significantly in age or gender. Seventy-seven per cent of the sample were female with 67% in the LSA group and 85% in the HSA group $\chi^2_{(1)} = 2.99$, $p = .084$. Furthermore, the analyses revealed that there were no significant differences in the proportion of ethnicities between the LSA and HSA groups $\chi^2_{(1)} = 7.50$, $p = .757$.

Table 3: *Socio-demographic characteristics of the main study sample*

Socio-demographic variables		Total Sample	LSA	HSA	HSA vs. LSA
	(N, %)	(N = 73)	(n = 33)	(n = 40)	$\chi^{2/}$ t
Sex	Male	17 (23.3%)	11 (33.3%)	6 (15.0%)	$\chi^2_{(1)} = 2.99, p=.084$
	Female	56 (76.7%)	22 (66.7%)	34 (85.0%)	
Age (Years)	Mean (SD)	22.38 (4.30)	22.30 (3.67)	22.45 (4.80)	$t_{(71)} =0.14, p=.886$
	Range	18-38	18-30	18-37	
Ethnicity	White British	40 (54.8%)	17 (51.5%)	23 (57.5%)	$\chi^2_{(1)} = 7.50, p=.757$
	White Other	10 (13.7%)	5 (15.2%)	5(12.5%)	
	Black African	4 (5.5%)	3 (9.1%)	1 (2.5%)	
	Mixed Ethnicity	5 (6.8%)	2 (6.1%)	3 (7.5%)	
	Indian	2 (2.7%)	-	2 (5.0%)	
	Chinese	5(6.8%)	3 (9.1%)	2 (5.0%)	
	Other Asian	5 (6.8%)	2 (6.1%)	3 (7.5%)	
	Any Other Ethnicity	2 (2.7%)	1(3.0%)	1 (2.5%)	

3.4.2 Comparison of social anxiety measures scores

Independent *t*-tests were used to see if there were significant differences between the HSA and LSA groups on the screening measures. The analysis identified that the HSA group scored significantly higher on the APPQSPS, BFNES and PHQ-9 compared to the low SA group (see Table 4). In addition, it is important to report the mean screening measure scores for the mid-range excluded group that are not included in the table below. The mid-range excluded group scored M= 34.37, SD=6.78 for the BFNES, M=22.98, SD=10.89 for the APPQSPS and M=4.63, SD= 3.60 for the PHQ-9. These values fall between the high and low SA group scores. Interestingly, the mean score of the BFNES for the HSA group (M=45.88, SD= 5.17) was comparable to the mean of a clinical sample reported by Weeks and colleagues (2008; M=46.91, SD= 9.27).

Table 4: *Comparison of screening scores between social anxiety groups*

	Main Study Social Anxiety Group					
	Low n=33		High n=40			
	Mean	*SD*	*Mean*	*SD*	*t (df)*	*p*
BFNES	24.24	4.46	45.88	*5.17*	*18.93(71)*	*< .001*
APPQSPS	9.88	4.08	36.23	*13.09*	*11.12(48)*	*< .001*
PHQ-9	2.33	1.53	5.85	*3.66*	*5.52(54)*	*<.001*

Further analyses were conducted to compare those individuals who participated and those who met the criteria but did not want to take part to identify any differences in the sample characteristics. Table 5 demonstrates that there are no significant differences between those in the low group who participated (n=33) and those who

chose not to participate (n=29) in BFNES or APPQSPS scores, however, those who did not participate were significantly higher in PHQ-9 scores. Table 5 also presents the results of comparisons between those in the high group who participated (n=40) and those who did not (n=23). There were no significant differences between groups.

Table 5: *Comparison of screening scores of those who participated in the main study and those who did not*

	Social Anxiety Group					
	Did not participate		Participated			
High Group	*Mean*	*SD*	*Mean*	*SD*	*t (df)*	*p*
BFNES	47.52	5.48	45.88	*5.17*	*1.19(61)*	*.238*
APPQSPS	37.22	14.97	36.23	*13.09*	*0.28(61)*	*.784*
PHQ-9	7.26	4.48	5.83	*3.66*	*1.36(61)*	*.180*
Low Group						
BFNES	24.10	4.42	24.24	*4.46*	*0.12(60)*	*.903*
APPQSPS	8.83	4.62	9.88	*4.08*	*0.95(60)*	*.345*
PHQ-9	5.17	4.29	2.33	*1.53*	*3.38(34)*	*.002**

3.5 Hypothesis Testing

Unless otherwise stated, two-way mixed model ANOVAs and its variants were utilised for analyses, with the between-subjects factor SA group (HSA versus LSA) and the within-subjects factor conversation condition (self-video present versus self-video absent). The primary aim was to explore whether there was a main effect of SA group and a main effect of conversation condition. In addition, an exploration of any interactions between the SA groups across conversation conditions. As stated previously, normality checks were conducted. See Table 6 for the means and standard deviations of the main study variables, which will be expanded upon in the subsequent section.

Table 6: *Means (SD) main study variables*

Variable		Self-Video On Mean (SD)	Self-Video Off Mean (SD)
Number of Socially Anxious Thoughts	**LSA**	1.88 (1.89)	1.61 (2.09)
	HSA	7.87 (4.24)	6.16 (4.02)
Anxiety Ratings (0-100)	**LSA**	13.79 (15.03)	14.79 (20.62)
	HSA	34.97 (20.82)	26.71 (20.67)
Self-Perception Ratings (0-100)	**LSA**	68.58 (17.62)	71.64(13.35)
	HSA	56.24 (15.01)	57.18 (17.39)
Imagery Ratings (0-100)	**LSA**	27.21 (31.66)	23.03 (29.66)
	HSA	35.95 (32.51)	28.08 (30.37)
Focus of Attention Questionnaire Self-Focus Subscale	**LSA**	8.03 (2.04)	7.76 (1.92)
	HSA	12.05 (3.53)	11.11 (3.45)
Self-Focus Ratings (0-100)	**LSA**	34.82 (22.48)	23.42 (23.53)
	HSA	43.34 (25.24)	37.24 (23.55)
% Fixation Duration Confederate's Face	**LSA**	86.78 (10.01)	91.95 (6.23)
	HSA	83.97 (15.45)	91.05(6.25)
% Fixation Duration Self -Video	**LSA**	3.57 (4.47)	-
	HSA	6.25 (10.06)	-

Note: Means are reported in a non-transformed state in the table and throughout this report, however in cases where transformations were conducted, ANOVA and ANCOVA are based on transformed data

3.5.1 Socially Anxious Thoughts and Anxiety Ratings

3.5.1.1 Number of socially anxious thoughts

A two-way mixed model ANOVA was conducted to compare the number of socially anxious thoughts experienced by those with HSA and LSA as measured by the adapted SCQ during a conversation when the self-video was present compared to when it was absent. The ANOVA revealed that the HSA group (M=7.02, SD=4.13) reported a significantly greater number of socially anxious thoughts compared to the LSA group (M=1.75, SD=1.99) regardless of the conversation condition, $F(1,69)=59.21$, $p<.001$. There was also a significant main effect of conversation condition, with both groups experiencing a greater number of socially anxious thoughts when the self-video was present (M=4.88, SD=3.07) compared to when it was absent (M=3.89, SD=3.06), $F(1,69)=6.60$, $p=.012$, therefore, suggesting that the manipulation of the self-video altered the number of socially anxious cognitions in both those with HSA and LSA. The interaction between condition and group did not reach significance, $F(1,69)=3.47$, $p=.067$.

3.5.1.2 Anxiety ratings (0-100)

A two-way mixed model ANOVA was conducted and identified that the HSA group (M=30.84, SD=20.75) reported greater levels of anxiety than the LSA group (M=14.29, SD= 17.83) regardless of conversation condition, $F(1,69)= 24.66$, $p< .001$. The ANOVA revealed that there was no significant effect of conversation condition on anxiety ratings $F(1,69)=3.26$, $p=.076$, nor was there a significant interaction between SA group and conversation condition $F(1,69)=2.05$, $p=.156$, therefore, suggesting that the manipulation of the video did not significantly alter anxiety ratings during the conversation.

The above results suggest that the HSA group reported that they were consistently more anxious across both conversations compared to the LSA group, and that they experienced a greater number of socially anxious thoughts. The frequency of socially anxious thoughts intensified for both groups during the conversation condition with the self-video, however no such effect was identified for anxiety ratings.

3.5.2 Self-perception

3.5.2.1 Self-performance ratings (0-100)

A two-way mixed model ANOVA revealed that the LSA group (M=70.11, SD=15.49) rated themselves as coming across significantly better than the HSA group, regardless of the conversation condition, (M= 56.71, SD=16.20), $F(1,69)= 15.77$, $p<.001$. There were no significant differences between conversation condition $F(1,69)=1.32$, $p=.254$, nor was there a significant interaction between group and conversation condition on perception ratings $F(1,69)= 0.37$, $p=.547$.

In addition, participants were asked to rate on a 0 (not at all) to 100 (very much) scale how helpful it was to have the video present and to what extent they were worried about being negatively judged because of the way they looked in the video. Independent t-tests were conducted and it was identified that the HSA group (M=37.84, SD=29.67) reported that they were significantly more worried than the LSA group (M=12.09, SD=17.63) about being negatively judged from what they saw in the video, $t(61)= 4.36$, $p<.001$. There were no significant differences between ratings of how helpful it was to have the video present, $t(69)= 0.28$, $p=.706$. In fact, both the LSA group and HSA group rated the usefulness of the video to be comparably low, as possible scores ranged from 0-100 (M=23.12, SD= 26.08; M=21.38, SD= 25.27, respectively).

3.5.2.2 Self-perception in video

A content analysis of 79 meaning units was conducted to explore similarities or differences between how individuals felt they came across in their mind with what they saw in the video (see Table 7). There were five participants who did not complete this question, however several participants wrote sentences that included multiple themes and these were included in the meaning unit count. Overall, 16.45% of all participants did not look at the video, with seven individuals; five in the HSA group and two in the LSA group, reporting that they actively avoided looking at the video. Interestingly, 24.05% of all participants described the video of themselves as unhelpful, with many explaining that it increased self-consciousness and led to greater distraction from the conversation. Of the LSA group, 46.7% suggested that they came across as expected with many individuals giving neutral descriptions of how they looked, for example *" I think I was probably coming across the same… I think it just probably looked like I was having a conversation!"* (Participant 2, LSA Group). However, only 4.08% of the HSA group seemingly described themselves as coming across in a way that is in line with what they thought they would looked like.

Both individuals in the LSA and HSA groups noted down negative descriptions of themselves in the video image, with 16.45% of the overall sample described seeing themselves in a less favourable light with regards to their appearance, personality and their behaviour. A notable difference between the descriptions relates to 16.33% of the HSA group reporting that they saw themselves as looking anxious in the video, however no participants in the LSA group described any statement that related to anxiety. In contrast to the aforementioned unhelpful effects of the video, there were some individuals in both groups who described the video being present as beneficial, the theme was more frequently reported by the HSA group (12.24%) than those in the LSA

group (6.66%). In addition, some individuals noted positive interpretations of how they were coming across from what they had seen in the video. Overall, the wide spread of responses suggests that there are a number of factors that may be contributing to how individuals perceive themselves in the video and for some this may be confirming one's already negative perceptions, whereas others have been able to utilise the stimuli to update less favourable impressions that they may hold of themselves.

Table 7: *Qualitative feedback on participants' perception of themselves in the self-video*

Themes	Unhelpful effects of the video	Helpful effects of the video	Positive descriptions of video image	Negative descriptions of video image	Signs of anxiety	Did not look at the video	Came across as expected
LSA (n=30)	7 (23.33%)	2 (6.66%)	0(0.00%)	4 (13.33%)	0 (0.00%)	3 (10.00%)	14 (46.67%)
HSA (n=49)	12 (24.49%)	6 (12.24%)	2 (4.08%)	9 (18.36%)	8 (16.33%)	10 (24.41%)	2 (4.08%)
Overall (n=79)	19 (24.05%)	8 (10.13%)	2 (2.53%)	13 (16.45%)	8 (10.13%)	13 (16.45%)	16(20.25%)
Example Meaning Units	**P18, LSA***:" I was much more conscious of myself and therefore was more nervous"* **P47, HSA**:"*I found that it made me more conscious and less able to focus on what I was going to say"*	**P25, LSA***: "I didn't seem as nervous and anxious as I thought I would be"* **P52, HSA**: *"...it helped me to see that I was not coming across as weird as I felt I was. I looked friendlier and engaging"*	**P46, HSA**: " *I think I looked quite confident and approachable"* **P61, HSA**: *"I thought I would look very nervous, but seeing myself I thought that I looked relatively calm"*	*P21, LSA*: "*When I could actually see myself I knew how bad I looked..."* **P72, HSA***: ''I looked inadequate and childish ...and saw my vulnerability which I found unsettling"*	**P53, HSA**: *"When I get nervous my face gets red, which is what I saw in the video."* **P48, HSA**:*" I thought I looked more nervous and anxious."*	**P7, LSA**: *" I didn't pay attention to how I looked on the video, instead I focused more on the person I was talking to."* **P59, HSA**: *"I didn't want to look at the video because I would become self-conscious"*	**P26, LSA***:" I thought the screen quite accurately represented how I was coming across."* **P54, LSA**: *" Similarity- looked nervous"*
Sub-Codes	Increased self-awareness; increased distraction; came across worse	Looked more relaxed; came across as better	Positive descriptions of appearance; personality; social skills	Negative descriptions of appearance; personality; social skills	Looked nervous; anxious; on edge	Did not pay attention to the video; actively avoided the video	Neutral description video image; no differences

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3.5.2.3 Self-imagery

A two-way mixed model ANOVA was conducted to explore the intensity of imagery that individuals experienced, there were no main effects of SA group, $F(1,68)=1.29$, $p=.261$, or of conversation condition, $F(1,69)=2.04$, $p=.158$. Furthermore, no significant interaction between SA group and conversation condition was identified, $F(1,69)=0.191$, $p=.664$.

To investigate whether there was an association between SA group and the perspective of the imagery, a chi-square test for association was conducted. One cell frequency was less than five and so a Fisher's Exact Test was undertaken between SA groups for reported imagery perspectives across both conversation conditions. There was not a statistically significant association between HSA and LSA groups reported imagery perspective, $p=.487$. Table 8 demonstrates the frequency of reported perspectives for both SA groups. A number of individuals did not report a perspective due to them not having a clear enough image, this was the case for 20 responses from the LSA group and 22 responses from the HSA across both conditions.

Table 8: *Comparison of imagery perspective between social anxiety groups*

	Own Eyes Perspective	External Perspective	Total
LSA	20 (43.5%)	26 (56.5%)	46 (46.0%)
HSA	20 (37.0%)	34 (63.0%)	54 (54.0%)

To investigate whether there was an association between the self-video present or self-video absent on the perspective of imagery reported, a chi-square test for association was conducted. All expected cell frequencies were greater than five. The

Chi-square test for association revealed that there was a statistically significant association between the self-video present versus self-video absent conversation condition on the reported perspective of imagery $\chi^2(1)= 4.474, p=.034$. There was a moderately strong association between conversation condition and imagery perspective reported, $\varphi = 0.343, p= .034$. That is, when the self-video was present participants were more likely than expected to take the external perspective, whereas when the video was absent they were more likely to take the own eyes perspective. Table 9 demonstrates the frequency of reported perspectives for both video conditions.

Table 9: *Comparison of imagery perspective between conversation conditions*

	Own Eyes Perspective	External Perspective
Video On	23 (40.4%)	34 (56.5%)
Video Off	17 (39.5%)	26 (60.5%)
Total	40 (40.0%)	60 (60.0%)

It is important to note that during the conversation with the self-video present, seven LSA individuals and seven HSA individuals reported that they did not experience clear enough imagery to report a perspective. During the conversation with the self-video absent 13 LSA individuals and 15 HSA individuals reported that they did not experience clear enough imagery to report a perspective. This suggests that when the video was absent fewer individuals were experiencing an image of how they were coming across in their mind.

3.5.2.4 Qualitative feedback: self-imagery

Table 10 demonstrates the qualitative descriptions that the participants provided in relation to the pictures or images they experienced in their mind during the conversation when the self-video was present, compared to when it was absent. In total, 66 meaning units were identified in the 'video-on' condition and 65 the 'video-off' condition. As before, a number of participants wrote sentences which included multiple themes, and this was included in the meaning unit count. As shown in the table, there was a wide range of descriptions of imagery across both groups. More specifically, within the descriptions it was evident that just over 34.85% of participants experienced unclear imagery in the 'video-on' condition. This figure was even higher in the 'video-off' condition, with 52.31% of participants reporting that the imagery was not clear enough to write a detailed description. Across both conversations more individuals in the HSA group described themselves as looking anxious in their imagery, however the reports were still fairly low with only 17.65% in the video-on condition and 8.83% in the video-off condition describing an anxious picture of themselves. Interestingly, there were no reports of images in the LSA group that included a description of themselves coming across negatively to the other person. In comparison, 17.65% of the HSA group included this in their description when the video was on, with no reports when the self-video was off. In summary, the range of qualitative descriptions of imagery was vast and due to the limited number of data it makes it difficult to draw specific conclusions, however this will be reflected upon in more detail in the discussion chapter.

Table 10: *Qualitative description of imagery experienced during both conversation conditions*

Themes	Present the self in a favourable light	Coming across negatively	Looking anxious	Looking relaxed or positive	External Perspective	Unclear Imagery	Neutral description	Miscellaneous
Video Off								
HSA (n=34)	3 (8.82%)	6 (17.65%)	6 (17.65%)	2 (5.88%)	2 (5.88%)	10 (29.42%)	5 (14.70%)	0 (0.00%)
LSA (n=32)	3 (9.38%)	0 (0.00%)	3 (9.38%)	1 (3.13%)	3 (9.38%)	13 (40.63%)	6 (18.75%)	3 (9.38%)
Total	6 (9.09%)	6 (9.09%)	9 (13.64%)	3 (4.55%)	5 (7.56%)	23 (34.85%)	11 (16.67)	3 (4.55%)
Video On								
HSA (n= 34)	2 (5.88%)	0 (0.00%)	3 (8.83%)	1 (2.94%)	1 (2.94%)	17 (50.00%)	4 (11.76%)	6 (17.65%)
LSA (n=31)	2 (6.45%)	0 (0.00%)	1 (3.23%)	2 (6.45%)	3 (9.68%)	17 (54.84%)	4 (12.90%)	2 (6.45%)
Total	4 (6.15%)	0 (0.00%)	4 (6.15%)	3 (4.61%)	4 (6.15%)	34 (52.31%)	8 (12.31%)	8 (12.31%)

Table 10 (Continued): *Qualitative description of imagery experienced during both conversation conditions*

Themes	Present the self in a favourable light	Coming across negatively	Looking anxious	Looking relaxed or positive	External Perspective	Unclear Imagery	Neutral description	Miscellaneous
Example Meaning Units	*P35, HSA: "Trying to present myself as friendly and approachable"* **P25, LSA:**"*A bit desperate to not let there be pauses making the conversation feel a bit unnatural and forced at times*"	**P62, HSA:** *"Loud, slightly annoying, awkward"* **P6, LSA:** *"…slightly awkward as result of new interaction"*	**P60, HSA:** *"… nervous person, because I was talking relatively quickly and sometimes struggling to say what I wanted to say*"	**P30, LSA:** *"Looked as if I was relaxed"* **P46,HSA:** *"I had an image of me looking more relaxed"*	**P21, LSA:** *"An image from their perspective"* **P36, HSA:** *"A vague perception of how I would appear from the other person's eyes"*	**P23,LSA:***"… a vague coloured silhoutte of my face "* **P41,HSA:***"I felt I did not have a clear enough image/picture to describe what it looked like"*	**P14, LSA:** *"Just me with the headphones on talking"* **P44, HSA:** *"Myself looking away from the screen "*	**P32, LSA:** *"Places of what we talked about"* **P11,LSA:** *"People walking by in a relaxed way in a tube station"*
Sub-Codes	Trying to seem friendly; look Interested; come across well	Self-evaluative thoughts; not coming across well; describing significant negative behaviour	Looking awkward, nervous or anxious; visualising anxiety symptoms e.g. blushing	Looking friendly; coming across positively	Imagery from an external point of view; partner's view	No clear imagery; no imagery; unable to describe	General description of what they imagined; they saw in the video	Imagining themselves in random or miscellaneous situation

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3.5.3 Self-focused attention

A two-way mixed model Analysis of Covariance (ANCOVA) was conducted to compare groups (HSA versus LSA) by condition (self-video on versus self-video off) on the Focus of Attention Questionnaire Self-Focus Subscale (FAQSFS) scores, with sex added as a covariate. The decision to control for sex and enter it into the analyses as a covariate was based on previous research, which has demonstrated that sex moderates the relationship between SA and SFA (Mansell et al., 2003; Vriends et al; 2016).

In the current model sex was not a significant covariate, $F(1,68)= 0.78$, $p=.775$. The mixed model ANCOVA demonstrated a significant main effect of SA group on FAQSFS ratings, with the HSA group (M=11.58, SD= 3.49) reporting significantly higher SFA to the LSA group irrespective of the conversation condition (M=7.90, SD= 1.98), $F(1,68)= 44.68$, $p<.001$. A significant main effect of conversation condition was also identified, with both groups demonstrating higher FAQSFS scores when the self-video was present (M=10.04, SD=2.79) compared to when it was absent (M=9.44, SD=2.69), $F(1,68) = 4.09$, $p=.047$, thus, suggesting that manipulation induced greater SFA in both SA groups. The interaction of condition and group was not significant $F(1,68) = 0.65$, $p=.421$, indicating that the two groups were not affected differently depending on whether the self-video was on or off.

In addition to the questionnaire measuring SFA, individuals were asked to rate how self-focused they were on a 0-100 scale to assess how the conversations may have influenced their perceptions of SFA. Therefore, a second mixed model ANCOVA was conducted to explore the differences on self-focus ratings between SA groups and across conditions, whilst controlling for sex as a covariate. As before, sex was not a

significant covariate, $F(1,68) = 0.07$, $p= .793$. The analysis demonstrated that there was a significant main effect of SA group on self-focus ratings, with the HSA group (M=40.29, SD= 24.40) reporting significantly higher SFA than the LSA group (M=29.12, SD= 23.01), $F(1,68) = 5.19$, $p=.026$. A significant main effect of conversation condition was also identified, with both groups demonstrating higher self-focus ratings, when the self-video was present (M=39.08, SD=23.86) compared to when it was absent (M=30.42, SD=23.54), $F(1,68) = 7.27$, $p=.009$. The interaction between condition and group was not significant, $F(1,68) = 0.87$, $p=.354$. In summary, the HSA group experienced significantly higher SFA during both conversations. Moreover, both SA groups reported significantly greater SFA when the self-video was present compared to when it was absent.

3.5.4 Visual attention

3.5.4.1 Eye-tracked fixations on the confederate's face

A mixed model ANOVA was conducted to explore differences in the mean percentage of time that participants fixated on the confederate's face compared to anywhere else on the screen during both conversation conditions. As before, the between-subjects factor was SA group (HSA versus LSA) and the within-subjects factor was the conversation condition (self-video present versus self-video absent). The analysis revealed a significant main effect of conversation condition, with both groups focusing on the confederate's face more when the self-video was absent (M=91.95, SD=6.24) compared to when the self-video was present (M=85.38, SD=12.72), $F=(1,62) = 12.65$, $p=.001$. Interestingly, there were no significant differences between the HSA (M=87.51, SD=10.85) and LSA (M= 89.37, SD= 8.12) groups' fixations on the confederate's face across both conditions, $F(1,62)= 0.41$, $p=.524$. Moreover, no

significant interaction between SA group and conversation condition was identified, $F(1,62) = 0.46$, $p=.831$.

3.5.4.2 Eye-tracked fixations on the self-Video

An independent *t*-test was used to compare the HSA and LSA mean percentage of fixation time on the self-video relative to fixating anywhere else on the screen, inclusive of the confederate's face. The *t*-test revealed no statistical significant difference between the two groups, $t(64)=1.16$, $p=.250$.

Overall, the eye-tracking data revealed that there were no significant differences between the HSA and LSA groups in fixations on the confederate's face or on the self-video. Differences were identified between conversation conditions; with both SA groups fixating on the confederate's face more when the self-video was absent compared to when the self-video was present. This suggests that the absence of the video facilitated participant's engagement with the conversation partner's face during the social interaction.

DISCUSSION

4.1 Chapter Overview

The present study built on research in face-to-face settings by undertaking a novel exploration of how anxiety, socially anxious thoughts, self-imagery, self-ratings of performance and SFA present during a naturalistic style online video interaction. In addition, this was the first study of its kind to examine the effect of manipulating a live self-video image on the aforementioned dependent variables that are proposed to maintain SA in face-to-face settings. Specifically, the aims of the current study were: (1) To investigate whether the HSA group would report greater anxiety, more socially anxious thoughts, heightened SFA, poorer subjective ratings of performance and more intense self-imagery from an observer perspective compared to the LSA group. (2) To examine whether the presence of the self-video increased SFA in both SA groups, and to investigate the effect of the self-video manipulation on the abovementioned target variables. (3) To explore whether visual attention directed to the self-video and conversation partner's face differed between the HSA and LSA groups. Furthermore, whether the time spent looking at the conversation partner's face differed depending on whether the self-video was present or absent on screen. The design of the current study sought to establish a degree of control within a laboratory setting whilst allowing for the assessment of SA within a live social interaction, thus, aiming for a balance between good internal and external validity.

In summary, the findings from the current study partially supported the first hypothesis by demonstrating that during an online social interaction individuals with HSA reported heightened SFA, more socially anxious thoughts and anxiety, and described poorer subjective ratings of performance compared to their LSA counterparts. The patterns of results are comparable to the findings in face-to-face

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settings (e.g. Alden & Wallace, 1995; Bögels & Mansell, 2004; Tanner et al., 2006) and are in line with what would be expected based on the cognitive model of SAD (Clark & Wells, 1995). Contrary to what was hypothesised and what would be anticipated based on the Clark and Wells (1995) model, the HSA group did not report that they experienced more vivid imagery nor were the self-images more likely to be from an observer perspective compared to the LSA group.

The second hypothesis was based on research in face-to-face settings, which has shown that the presence of mirrors increases SFA (Bogels et al., 2002; Bolt et al., 2014; Hofmann & Heinrichs, 2003), and so it was hypothesised that both groups would experience greater SFA when the self-video was present. This hypothesis was supported by our findings. In comparison, no directional hypotheses were stated for the impact of the video manipulation on anxiety, socially anxious thoughts, self-performance ratings or self-imagery due to the conflicting findings between mirror manipulations and video feedback. The present study's findings were mixed; for example, the inclusion of the self-video amplified the number of socially anxious thoughts experienced in both groups. However, no significant main effects of the manipulation or interactions were found on levels of anxiety, self-performance ratings or intensity of self-imagery. Potential explanations of the present study's findings will be discussed in detail throughout the chapter.

Due to the limited amount of literature that has explored the nature and content of self-imagery in SA and no known investigation of what individuals perceive when they attend to the self-video, the present study sought to investigate this further. Qualitative analyses revealed a wide spread of themes in regard to what individuals perceived when they looked at the video of themselves and the nature of imagery they experienced. Moreover, a chi square test discovered a significant association between

video condition and perspective of self-imagery. This will be reflected upon in the context of other findings in the study and within the wider literature.

The third question concerned visual attention during the conversation conditions. As the present study was the first to explore visual attention within an online conversation without manipulating additional social stress, we were unable to state a directional hypothesis. The findings showed that there were no differences between the HSA and LSA groups on the amount of time they fixated on the self-video or the conversation partner's face. Interestingly, the present study did identify that both SA groups looked significantly more at the conversation partner's face when the self-video was absent compared to when it was present.

Overall, the present study's findings will be discussed in relation to existing theory and previous literature. Following this, a summary of the main findings will be presented alongside potential implications of the results. Then, the strengths and limitations of this piece of work will be considered, with suggestions for future research. Finally, the discussion will close with a statement of the conclusions that can be drawn from the findings.

4.2 Main Findings in the Context of Research and Theory
4.2.1 Anxious thoughts and feelings

Clark and Wells (1995) theorise that individuals with HSA experience a greater proportion of socially anxious thoughts and anxiety compared to those with LSA. The present study adapted the Social Cognitions Questionnaire (SCQ) to assess the number of socially anxious thoughts experienced by participants when engaging in an online video conversation. The findings showed that the HSA group recounted significantly more socially anxious thoughts compared to the LSA group. This result is comparable

to the findings identified in face-to-face settings (e.g. Mansell & Clark, 1999; Schultz & Heimberg, 2008; Tanner et al., 2006) and in an online context (Ryan et al., in prep). Specifically, Ryan and colleagues (in prep) showed that individuals in an HSA group reported more socially anxious thoughts when using Facebook compared to a LSA group. As the aforementioned study was cross-sectional in nature, the present study extends the findings by demonstrating that the trend is upheld within a 'live' conversation in an experimental setting.

In addition to experiencing a greater number of socially anxious thoughts, the present study identified that the HSA group reported more anxiety compared to the LSA group. Woody and Rodriquez (2000) explored subjective ratings of anxiety during a face-to-face interaction task and established a similar pattern for individuals with SAD to state that they feel more anxious than their non-socially anxious counterparts. In fact, the present study's findings are in line with research which has identified that elevated levels of anxiety and social fears are found in socially anxious individuals when communicating online (McCord et al., 2014; Ryan et al., in prep).

Taking the findings on anxious thoughts and feelings together, the present study demonstrates that highly socially anxious individuals are more anxious and report a greater frequency of socially anxious thoughts when communicating in an online video conversation in comparison to those with lower levels of SA, which suggests that similar cognitions and feelings that perpetuate SA in face-to-face settings may also maintain SA in online interactions. This is the first study of its kind to investigate this during an online video conversation and provides support for the assertion that the Clark and Wells (1995) model is applicable within an online setting.

When reflecting on the impact of the experimental manipulation on levels of anxiety, it is evident that the current findings suggest that there were no significant differences between the conversation conditions when the self-video was present compared to when it was absent. The results suggest the HSA group experienced more anxiety during the video interactions and this pattern remained regardless of whether the self-video was present or absent. This finding is not aligned with research, which has demonstrated that video feedback reduces state anxiety and updates negatively biased self-perception (Rodenbaugh et al. 2010). Based on the evidence for video feedback, it could have been hypothesised that the HSA group would experience reductions in anxiety after seeing themselves in the video. Nevertheless, there have been conflicting findings in the literature. For example, Bögels and colleagues (2002) found that when participants viewed a reflection of themselves in a mirror there were no increases or decreases in anxiety levels in either high or low SA groups. This result is in accordance with the current study's findings, however does not offer an explanation as to what might be happening during this process.

There have been two studies that may provide an insight into why the discrepancies may have occurred (Orr & Moscovitch, 2010; Parr & Cartwright-Hatton, 2009). Both studies identified that video feedback alone is not effective in reducing anxiety; instead, significant reductions are attributed to the detailed cognitive therapeutic work before and after the presentation of the video recording. Specifically, cognitive preparation is aimed at shifting the individual's attention away from their subjective thoughts and feelings with regards to how they feel they are coming across in the video. Through this procedure individuals are encouraged to watch themselves as if they are watching a stranger (Rodenbaugh, 2004). The present study offered no instructions as to how participants should view the self-video and so it could be

suggested that individuals utilised their own thoughts and feelings to evaluate how they were coming across, even when the self-video was present. This is supported by Warnock-Parkes and colleagues' (2016) assertion that many socially anxious individuals experience self-critical thoughts while watching themselves in a video and this can create a block that prevents them from gaining an objective view of how they are coming across, therefore not updating negative self-perceptions and reducing anxiety. This seems pertinent to the finding that during both conversations the HSA group experienced a greater number of SA thoughts compared to the LSA group, and may have led to anxiety persisting no matter whether the self-video was present or absent.

An interesting result from the present study was that both the HSA and LSA group experienced more socially anxious thoughts when the self-video was present. This fits with both SA groups rating the usefulness of the self-video as particularly low. In addition, 24% of the overall sample commented on the unhelpful effects of the video in the qualitative feedback, with a number of descriptions stating that it heightened self-awareness. When exploring the possible explanations for the findings, it could be suggested that the increase in SFA in the self-video condition led to greater reports of socially anxious thoughts. More specifically, drawing on the Clark and Wells (1995) model, it is plausible to suggest that the increase in SFA resulted in participant's becoming more aware of their own thoughts. This is in accordance with Ingram's (1990) definition of SFA, which states that SFA is an awareness of self-referent and internally generated information. Although the present study did not assess the number of thoughts experienced more generally it could be hypothesised that both groups experienced heightened awareness of their overall cognitions rather than just an increase in socially anxious thoughts. An alternative explanation to the findings could

be that the increase in socially anxious thoughts is in fact related to what participant's perceived when they attended to the self-video. However, in line with this argument one would expect that both groups would rate themselves as coming across as worse when the self-video was present and this was not the case. Instead, the findings indicate that the HSA group continued to experience a greater quantity of socially anxious thoughts regardless of the conversation condition. This pattern is in accordance with research that has demonstrated that socially anxious individuals experience a greater frequency of negative automatic thoughts in face-to-face settings (Dodge et al., 1988; Schultz & Heimberg, 2008).

4.2.2 Self-perception

Research in face-to-face settings has demonstrated that socially anxious individuals rate themselves as coming across less favourably than those with lower levels of SA (Bolt et al., 2014). Moreover, the tendency to focus on one's negative self-performance increases access to negative self-images, which in turn contributes to the development of a biased self-perception (Hirsch et al., 2003; Ng et al., 2014). In line with this, biased performance ratings and negative self-images are posited to be key maintenance processes in SA (Clark & Wells, 1995). Accordingly, it was hypothesised in the present study that individuals with HSA would report poorer self-performance ratings and more vivid self-images after the video conversation. In addition, it was hypothesised that the images would be more likely to be from an observer perspective.

The present findings demonstrate that the HSA group rated themselves as coming across as significantly poorer than the LSA group in the conversation tasks. In addition, the HSA group noted that they were significantly more concerned about being negatively judged based on what they saw in the self-video. This fits with the

aforementioned finding that the HSA group experienced more anxiety and socially anxious thoughts during the conversation. Moreover, this is in accordance with the stated hypothesis and with findings in face-to-face settings that have shown that individuals with HSA have a tendency to overestimate negative aspects of their performance compared to ratings of observers (Alden & Wallace, 1995; Harvey et al., 2000; Stopa & Clark, 1993). Interestingly, during the present study's video interaction, the conversation partner was 'neutral' in presentation and not critical. This suggests that even in the absence of negative feedback the HSA group judged themselves as coming across as worse. This is perhaps not surprising given that socially anxious individuals have an inclination to perceive ambiguous scenarios as negative, even when positive interpretations are offered (Amin, Foa, & Coles, 1998; Stopa & Clark, 1993)

In addition to the main effect of differing SA levels on performance ratings, it was hypothesised that individuals with HSA would report more vivid imagery during the social interaction and that the self-imagery would be more likely to be from an external-observer perspective. Contrary to expectation, the present findings failed to discover support for either aspect of the hypothesis. Firstly, there were no significant differences between SA groups with regards to how vivid the self-images were. This does not follow in accordance with research in face-to-face settings, which has demonstrated that individuals with clinically diagnosed SA experience a clearer visual image related to how they come across compared to controls (Hackmann et al., 1998). Nor is this in line with a recent study, which found that 90% of speech anxious participants identified a clear visual image that represented their anxiety (Homer, Deeprose, & Andrade, 2016). A possible explanation for the discrepant finding in the present study might be grounded in the nature of the experimental task. For example, in Homer and colleagues' (2016) study, participants were subject to an in-depth

interview where they were asked to report a recent anxiety-provoking situation in detail and hold the anxiety-provoking image in mind whilst engaging in a task. In comparison, in the present study, participants were asked to recall if they experienced any imagery once they had completed a five-minute video conferencing conversation. Moreover, general images and pictures were examined rather than asking participants about specific anxiety provoking images.

Another potential explanation for the difference between the present study's findings and those identified in the literature may be related to the conversation task. It is conceivable that the video based stimuli on screen might have distracted participants from the mental imagery experienced. More specifically, the video images may have interfered with the construction of a vivid image. In fact, task interference and negative imagery in SA has been recently explored in a non-clinical sample of speech anxious undergraduate students (Homer et al., 2016). Homer and colleagues (2016) found that both visual and auditory tasks significantly reduced the vividness of an anxiety-provoking image of the self, with superior reductions associated with the visual cues. When relating these novel findings to the current study, it is plausible that exposure to both visual (video) and auditory (audio) cues increased cognitive load, which could have potentially reduced the vividness of imagery in both SA groups.

In addition to the above hypothesis, the current study failed to find a significant bias towards the external-observer perspective in those with HSA, which is a finding that has been repeatedly demonstrated in the literature (Hackmann et al., 1998; Wells & Papageaorgiou, 1999). Instead, across both SA groups there was a close to a 60% 'observer perspective' to 40% 'own eyes' perspective divide. Contrary to the majority of the literature, there have been two recent studies that have not demonstrated such a bias for observer perspective in those with HSA. Moscovitch and colleagues (2011) and

Homer and colleagues (2016) showed a near equal spread between both visual perspectives in individuals who were either high in SA or speech anxiety, which supports the present study's findings. The reason behind the discrepant findings is not entirely clear, one possible explanation may be that there is a genuine difference between the imagery experienced by those with sub-clinical levels of SA (Moscovitch et al., 2011; Homer at al., 2016) compared to those with clinically diagnosed SAD (Hackmann et al., 1998; Wells et al., 1998; Wells & Papageaorgiou, 1999). This assertion would fit with the current study given the non-clinical sample. Alternatively, there has been research that has highlighted the notion that imagery perspective may in fact vary between socially anxious individuals and across different social situations (Coles et al., 2001). More specifically, it has been suggested that highly anxiety-provoking situations, such as conditions that are performance or public speaking in nature, may be more likely to be recalled from external point of views (Moscovitch et al., 2011). As the current study is the first of its kind to explore imagery perspective during an online video conversation it is not possible to comment on this assertion, however it would be interesting to conduct future research investigating this to ascertain whether different forms of online social interactions may elicit varying levels of anxiety and impact on the perspective of the imagery.

When concentrating on the effect of the presence or absence of the video on performance ratings and the vividness of imagery, it is evident that there is little change between conditions on either construct. This is not in line with previous studies which have shown that presenting individuals with a retrospective video recording of themselves helps to update negative self-perception and self-imagery in those with HSA and SAD (Harvey et al., 2000; Warnock-Parkes et al., 2016). However, it is important to note that participants in the present study were not directed to look at the

self-video and it is evident that both groups of participants spent relatively little time fixating on it. More specifically, the LSA group directed their visual attention to the self-video just 4% of the overall time that they fixated on the screen, with the HSA group attending to the self-video 6% of the overall time. Based on this, it follows that presenting individuals with the self-video would not be associated with the same helpful effects as video feedback where participants are directed to solely focus on the video of the self.

Despite the small proportion of time that participants looked at the video, exploration of the qualitative data revealed a range of themes related to how participants felt they were coming across in the self-video. This suggests that individuals were able to identify a general impression of themselves in the video image. More specifically, a number of themes were related to descriptions of participant's appearance or social skills, which is in accordance with a framework posited by Moscovitch (2009). Moscovitch (2009) suggests that individuals with HSA have core anxieties or fears that typically fit into one of four distinct but overlapping dimensions: (a) concerns about social skills and behaviours; (b) concerns about visible signs of anxiety; (c) concerns about physical appearance; (d) concerns about personality. In line with this, it is interesting to note that 16% of the overall sample in the present study reported negative descriptions of how they came across in the video. Moreover, they endorsed either concerns about their appearance, personality or social skills similar to those incorporated in Moscovitch's (2009) framework. In addition, 16% of the HSA group noted that they looked anxious in the video image, suggesting that they may have had concerns about visible signs of anxiety. Due to the broad range of themes identified between and within groups, it is conceivable that attending to the self-video may have had differential effects on participants, and as a consequence contributed to no overall

differences being identified between the video conditions. The varied impact of the self-video is supported by 24% of participants qualitatively reporting the unhelpful effects of the video, whilst 10% described helpful effects.

When reporting on the nature of the imagery experienced, it is evident that there were a variety of themes described within the qualitative feedback. In keeping with previous studies (e.g. Hackmann, 1998), a number of spontaneous images were reported during the interaction however this was significantly lower than those reported in the aforementioned seminal study. For example, in the self-video present condition in the current study, 29.42% and 40.63% of the HSA and LSA group respectively described experiencing unclear imagery and found it difficult to provide rich qualitative accounts. This rose to 50.00% and 54.84%, respectively, in the video absent condition. As mentioned in a previous section, a potential explanation for this surprisingly low result could be associated with increased cognitive load interfering with the construction and memory of images. Interestingly, of the images reported, there were a number that were related to negative aspects of how the individual was coming across to the conversation partner, and it is apparent that higher percentages were identified in the HSA group. However due to the particular small cell sizes, meaningful statistical analyses were unable to be conducted.

For the perspective of the imagery, the analyses demonstrated a significant association between the video manipulation and the perspective of the imagery. It is evident that when the self-video was present a greater frequency than expected reported the imagery from an observer perspective. Conversely, in the self-video absent condition a greater frequency than expected was identified for the own eyes perspective. Given the interference effects detailed by Homer and colleagues (2016), it could be hypothesised that viewing an external image of oneself whilst conversing may

have provided feedback that interfered with the construction of mental imagery and resulted in it being more likely to be viewed from an external perspective, similar to what individual's saw in the self-video. However, due to the limited exploration of this assertion within the present study or within the current literature, it is not possible to provide evidence for this. Nevertheless, the findings suggest that the effect seeing a live video of oneself on the construction of mental imagery is an interesting area of research that would benefit from further exploration.

Overall, on a quantitative level there seems to be a lack of difference in ratings of performance between the video conditions. The trend suggests that the LSA group rated themselves as coming across more positively regardless of whether the self-video was present or absent. In addition, the intensity of mental imagery does not appear to be affected by the presence or absence of the self-video, however the perspective of the imagery does. A unique contribution of the current study is the identification of a wide range of themes related to how an individual perceives that they are coming across in the self-video and how they visualise themselves in the mind's eye, even when both SA groups directed their attention towards the video a small proportion of the time. This underscores the need for a specific exploration of an individual's core fears to understand what such constructions may mean to them and how this relates to their self-perception.

4.2.3 Attention

4.2.3.1 Self-focused attention

Clark and Wells (1995) theorise that highly socially anxious individuals experience heightened SFA. This assertion has been supported by numerous studies, which have consistently shown that greater SFA is displayed in those with HSA and

SAD compared to those with lower levels of SA (Bögels & Mansell, 2004; Clark & McManus, 2002; Hope et al., 1989; Spurr & Stopa, 2002). In line with the first hypothesis, and in keeping with the previous literature, participants in the HSA group in the present study reported significantly higher levels of SFA, as informed by scores on the FAQSFS and the overall self-focus ratings. The trend for individuals with HSA to score higher than those with LSA on the FAQSFS is in accordance with findings reported by Chan (2011), who explored SFA in a non-clinical sample of students from Hong Kong. Chan (2011) identified that the LSA group scored on average 6.64 and the HSA group scored on average 9.91 when engaging in a face-to-face social interaction task. Using the same measure in the present study, the means for both the LSA and HSA groups were higher, 7.90 and 11.58 respectively. In fact, the findings for the HSA group in the present study were aligned with mean FAQSFS scores reported by a clinical sample of individuals diagnosed with SAD scoring on average 11.38, following a face-to-face speech task (Woody & Rodriquez, 2000). The similarity between the HSA group and a clinical sample is not surprising given that the mean score on the BFNES screening measure for the HSA group was close to the mean of a clinical sample (Weeks & colleagues, 2008).

In the present study, the trend for heightened SFA in the HSA group was upheld when participants were asked to rate how self-focused they were on a 0 to 100 scale. Furthermore, the present findings support recent online video based research that has demonstrated a main effect of SA group on levels of SFA. Specifically, Vriends and colleagues (2017) showed that both HSA and SAD groups self-reported greater SFA compared to a LSA and control group following an online video conversation with a confederate. Together with Vriends and colleagues (2017), the findings from the present study build on the literature regarding face-to-face settings and provide support

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for the notion that online video interactions elicit higher levels of SFA in those with higher levels of SA.

A unique contribution of the present study was that it explored the impact of the self-video on a number of processes that are suggested to maintain SA in face-to-face settings. As mentioned in the introduction chapter, research has demonstrated that the presence of mirrors can manipulate SFA in HSA and SAD groups (Bögels et al., 2002; Bolt et al., 2015; Hofmann & Heinrichs, 2003). In fact, the aforementioned studies have confirmed that the SFA inducing effect of mirrors also appears in those with LSA and is evident during both social and non-social tasks (Bolt et al., 2014; Hofmann & Heinrichs, 2003). Based on this, it was hypothesised that viewing a self-video in the present study would heighten SFA in both SA groups. The findings provided support for this hypothesis; participants in the HSA and LSA groups experienced a significant increase in SFA, as measured by the FAQSFS and self-focus ratings when they were presented with video feed of themselves. Similar to the effect of instructions, mirrors and the presence of video cameras, the current findings suggest that the presence or absence of a self-video feed can be utilised to manipulate SFA (e.g. Bögels & Lamers, 2002, Hofmann & Heinrichs, 2003; Zou et al., 2007). Interestingly, there was not a significant interaction between the SA groups and video conditions on SFA on either measure, suggesting that the effect of the manipulation on both groups was similar. Thus, although individuals with LSA do not typically report high levels of SFA, the presence of the self-video seemingly induced greater SFA in this target group.

As mentioned previously in the introduction chapter, the manipulation of SFA has been associated with mixed findings with regards to the causal effect on increasing anxiety and more negative self-evaluations of performance (Bögels & Lamers, 2002; Canvin et al., 2016; Woody & Rodriguez, 2000; Zou et al., 2007). In the present study,

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in the self-video present condition, there were no significant increases or decreases in ratings of anxiety, vividness of imagery or self-perception ratings. However, there were significant differences found in the number of socially anxious thoughts, perspective of imagery and the time participants focused on the conversation partner's face. It is not possible to conclude whether such differences are directly related to the increase in SFA found in the video present condition per say, or attributed to the visibility of the video image, however it would be interesting for research to explore whether alternative methods of manipulating SFA result in comparable changes to socially anxious thoughts and visual attention directed towards a conversation partner.

4.2.3.2 Visual attention

A limited number of studies have explored visual attention among those with high or low SA during a dynamic social interaction. As such, the present study set out to explore whether there were any differences between the HSA and LSA groups' visual attention directed towards the self-video. The findings from the present study demonstrated no main effect of SA group with regards to the duration of time individuals fixated on the self-video. This finding is in line with the results by Vriends and colleagues (2017) who found no differences between a HSA and LSA group on an eye-tracked measure of overall fixations durations on the self-video in the online video conversation. However, Vriends and colleagues (2017) found that the HSA group looked longer at the self-video when the confederate conversation partner intentionally became critical. Moreover, during their second experiment, the SAD group looked more at the self-video throughout the conversation compared to the control group (Vriends et al., 2017). Thus, it is evident that those who have clinically diagnosed SAD are more likely to look at the self-video to a greater degree and that this effect is only

identified in the HSA group when they are criticised. Based on this, an explanation for the null finding in the present study may be related to the conversation task not eliciting sufficient anxiety to direct the HSA groups' attention towards the self-video. This may have been the case because no restrictions were placed upon the conversation in the present study and participants were able to drive the content of the conversation, which may have made it a less anxiety provoking experience.

In addition to the exploration of group differences on visual attention directed towards the self-video, the current study set out to investigate the allocation of visual attention towards the conversation partner's face. Similarly, to the aforementioned pattern on the self-video, no significant differences between the HSA and LSA groups were found in the time participants attended to the conversation partner's face. This finding is not in accordance with literature, which has shown that individuals with HSA avert their eye-gaze away from faces (Baker & Edelmann, 2002). However, it does support the results from Vriends and colleagues (2017) who identified that neither a sub-clinical or SAD group looked more or less at the conversation partner compared to their respective comparison groups. This suggests that visual attention directed towards the conversation partner may not be a central defining feature of how SA presents in the context of an online video conversation.

A novel contribution of the present study was the examination of the impact of the presence of the self-video upon the overall time participants fixated on the conversation partner's face during the conversation. Interestingly, the findings showed that when the video of the self was present, participants looked at the conversation partner significantly less. It is conceivable that the addition of the video increased distraction and reduced focus on the conversation partner and the task at hand. When reflecting on the overall effects of the presence of the self-video on other measured

variables, it is evident that its presence increased SFA and socially anxious thoughts. Drawing on insights from the Clark and Wells (1995) model, it is possible that when SFA is elevated and socially anxious cognitions are heightened, individuals have a tendency to direct their attention towards internal rather than external stimuli, for example away from the conversation partner's face. Conversely, when the self-video is absent, participants focus more on the conversation partner's face and display less SFA and fewer socially anxious thoughts. These effects are similar to those demonstrated by Canvin and colleagues (2016), who showed that directing attention away from internal cues and towards faces in the environment led to decreased levels of SFA and self-evaluative thoughts.

4.3 Summary of Key Findings and Implications for Clinical Practice

Overall, it is evident from the current findings that individuals with higher levels of SA experience more anxiety, socially anxious thoughts, SFA and poorer subjective ratings of performance during online video conferencing conversations compared to those with lower levels of SA. This was expected and in line with the Clark and Wells (1995) model, which highlights the key factors that maintain SA in face-to-face settings. The above suggests that individuals with HSA may continue to experience SA in online video interactions and supports preliminary findings that have suggested that components of the models are activated in such settings.

The aforementioned results have implications for face-to-face theoretical models of SA, as it indicates that they could be revised to consider other forms of social interactions. In addition, there may be potential implications for the assessment, formulation and treatment of SAD, which currently focus exclusively on the processes that are activated during face-to-face settings (Clark & Wells, 1995). Specifically, the

initial stages of treatment based on the Clark and Wells (1995) theoretical model are aimed at developing an individualised version of the model to identify particular cognitions, feelings and behaviours that may be maintaining the individuals' presenting difficulties in face-to-face settings. In light of the present study's findings, it could be suggested that the individualised model in its current form may neglect a significant proportion of an individuals' daily social interactions, given that 86% of young adults communicate over the Internet daily (Pew Research Centre, 2017). Thus, models that explain SA in face-to-face contexts may not fully capture how processes present in online contexts and so future research should be dedicated to disentangling the similarities and differences between the specific maintenance factors in face-to-face compared to online settings. Overall, the current study's findings suggest that assessment and formulation models may be strengthened by taking into account an individual's online social interactions, with a specific assessment of the thoughts experienced when communicating via the Internet.

Contrary to the study's predictions, individuals in the HSA group did not experience more intense self-imagery nor were they more likely to report this from an observer perspective. A number of possible explanations have been suggested, namely the increased cognitive load associated with the study task and the impact this may have had on imagery. In addition, despite the demonstration of increased SFA in the HSA group, there were no differences identified in visual attention directed towards the self-video or the conversation partner's face. This suggests that different mechanisms may underlie the process of SFA compared to externally directed attention and supports Clark and Wells' (1995) assertion that it is attention directed towards internal cues which underpins the maintenance of SA.

When reflecting on the main effects of the video condition, a key finding is that

the presence of the self-video increased self-reported SFA. This builds on research in face-to-face settings, which has shown that SFA can be experimentally manipulated via a number of methods, including instructions and the presence of video cameras (Norton & Abbott, 2016). Notwithstanding a novel and unique contribution of the present study is that it has revealed that SFA can be manipulated by the presence or absence of a self-video image. Manipulating SFA through instructions to focus on the self, as opposed to focusing attention externally is a key part of the current CBT programme. This is aimed at helping individuals appreciate the unhelpful effects of SFA and the benefits of shifting one's attention externally (Mayo-Wilson et al., 2014). In fact, this shift in attention has been identified as one of the key mediators of successful clinical outcomes (Hedman et al., 2014; Mörtberg, Hoffart, Boecking, & Clark, 2015). Given the findings from the present study, it is conceivable that the technique of having a self-video present or absent could be utilised as a novel and standardised way of manipulating SFA during psychological interventions.

Not merely did the presence of the self-video increase SFA during the current study, it also amplified the number of reported socially anxious thoughts and reduced engagement with the conversation partners face in both SA groups. Moreover, the HSA group reported being more worried about receiving negative judgement based on what they saw in the self-video. Despite the findings being preliminary in nature, they provide evidence that the presence of the self-video may be associated with a number of detrimental effects, which could have implications for the Internet-delivered intervention for SAD. The current procedure in the Internet-delivered intervention involves service-users having their self-video switched on when they communicate with their allocated therapist. This is visible until the therapist starts to record the social interaction for behavioural experiments and, at this point, the self-video disappears. The

findings from the present study suggest that the self-video may in fact enhance SFA and socially anxious thoughts, which could result in individuals entering the behavioural experiment in a self-focused state and experiencing unhelpful thoughts regarding how they are coming across. In comparison, when the self-video was absent in the present study, participants reported reduced SFA and less socially anxious thoughts, and demonstrated greater engagement with the conversation partner's face, which may have implications for the internet-delivered intervention for SAD. Specifically, if this finding can be replicated in a clinical sample through the same video conferencing programme utilised by the Internet-delivered intervention for SAD, it could be recommended that the self-video should be switched off during the entire communication with the therapist. This could allow socially anxious individuals to shift their attention externally and reduce the frequency of socially anxious thoughts they experience during the conversation.

4.4 Strengths, Limitations and Future Directions

4.4.1 Strengths

A considerable strength of the present study is that it focused on a number of maintenance processes of SA within an online video interaction. This builds on previous research that has focused on fewer processes (e.g Vriends et al., 2017) or utilised cross-sectional designs to explore text-based online communication (e.g. Ryan et al., in Prep). The experimental nature of the present study contributes valuable knowledge with regards to how individuals with HSA may experience online social interactions. Moreover, the experimental paradigm has made an important step towards enabling a dynamic social interaction, within a controlled laboratory setting. The manipulation of the video presence has demonstrated an ecologically valid way of

altering SFA, something that has not been explored in previous research. A methodological strength of the study task is that it counterbalanced the order of the self-video being present, thus allowing for the effect of timing of the video present and absent conditions (e.g., habituation, concentration, novelty) to be accounted for. It is key to note, however, that participants' performance within the first condition may have impacted the second condition, regardless of whether the self-video was present or absent during the first conversation. For example, if participants felt anxious or self-conscious about certain aspects of the first conversation, this may have carried over to the second conversation and impacted participants' subjective reports. In the current study, it may have been helpful to have implemented a filler task between the two conversations or controlled for order within the analyses. Alternatively, a between subjects design could have been selected to prevent participants experiencing more than one condition and therefore removing the influence of carry-over effects.

It is acknowledged that the video conversations were somewhat artificial, however the present study endeavoured for the conversation to be as naturalistic as possible by utilising a popular video conferencing site 'Skype' and for the conversation to have minimal restrictions placed upon it with regards to content, thus, increasing the generalisability of the findings to everyday online communications. A further methodological strength is attributed to one conversation partner being used in the study, who was blind to the study aims, conditions and SA groups. Unlike Vriends and Colleagues (2017) who utilised seven confederate conversation partners, the use of one individual will have contributed to a level of consistency within the conversations, which will have reduced potential biases associated with individual differences.

The study employed eye-tracking to combine methods to enrich our understanding of how individuals engage with the Skype video. Moreover, the use of a

remote eye-tracker minimised restrictions that bulky and unnatural equipment may have placed on participants during the conversation. Both methods reduce the impact that biases associated with unnatural additions to the experimental room and increase the ability to generalise to everyday social interactions.

4.4.2 Limitations and Future Directions

A limitation of the present study is that it utilised a community sample rather than a sample of individuals with clinically diagnosed SAD and so any proposed implications for clinical practice should be interpreted with caution. The findings need to be replicated within a clinical sample before definitive conclusions can be drawn, however as highlighted in the introduction, SA exists on a continuum and exploring SA among community samples is an extremely common and established procedure within the SA literature. In addition, the scores on the BFNES screening measure in the current study were similar to those found within a clinically diagnosed sample and so this strengthens the inferences drawn based on the findings. Despite this, it is acknowledged that the nature of the community sample limits the overall generalisability of the findings to individuals with SAD and so an important direction for future research would be to include a clinically diagnosed SAD group to identify whether differences on a diagnostic level impact on how the maintenance processes of SA present in an online video context. Moreover, it would be interesting to add a comparison condition in a face-to-face setting to explore how individuals' experience online video interactions in direct comparison to a face-to-face setting.

The number of participants who took part in the HSA group reached the sample size required based on the a priori power calculation, however the LSA group had five

people less than sufficient. This resulted in the analyses being slightly underpowered and increased the likelihood of committing a Type II error. In addition, it is acknowledged that it was beyond the scope of this project to conduct further statistical analyses on the data and this may have limited some of the conclusions drawn. For example, content analysis was applied to explore qualitative feedback concerning how participants felt they were coming across in the video image as well as the types of imagery they experienced during the conversations. A strength of using content analyses is that it permits for quantitative analyses and so it may have also been beneficial to analyse the themes quantitatively, however given the time constraints this was not feasible and so was not completed.

The sample consisted of a self-selecting group of individuals and so it is acknowledged this sample may not be representative of the overall target group. This is particularly pertinent to those with SA as it is plausible that individuals who exhibit greater fear within social situations may not sign up to take part in such research. In addition, it is important to note that there were a higher proportion of women than men who took part in the study, which may have reduced the generalisability to both sexes. However, the higher proportion of females in the sample is reflective of the overall proportion of SAD diagnoses in the general population, with more women than men identified (Kessler et al., 1994). Moreover, in light of specific literature on how sex differences affect how SFA presents, sex was statistically controlled for in the analyses.

An important aspect of the findings that should be acknowledged is the small proportion of time that both the HSA and LSA groups directed their visual attention to the self-video. Although this captures how often individuals may naturally attend to the self-video, it limits our understanding of how a live video feed may be comparable to traditional forms of video feedback, and the potential for such technology to update

negative self-perception and anxiety. Future research could concentrate on manipulating visual attention towards the self-video to assess whether this may have an effect on reported self-perception and its association with self-reported SFA.

Whilst a strength of the eye-tracking measurement was that it did not require participants to be restricted by equipment, increasing the generalisability of the conversation to everyday life and preventing participants from seeing themselves wearing an unnatural eye-tracking device, a limitation follows with the unrestricted method, as participants were not fixed to keeping their eyes on the screen constantly. As a consequence, there were times during the conversation when participant's eyes were not picked up on the screen. More specifically, it was identified that 29 (15 HSA versus 14 LSA) participants fixations were picked up less than 70% of the time during the conversations. The study attempted to account for this by utilising a similar fixation computation to Vriends and colleagues (2017) and calculating the percentage of overall fixation durations on the area of interest (self-video and confederates face) compared to the total time their eyes were tracked on the screen. However, it is acknowledged that the unrestrictive eye-tracking methods may have reduced the internal validity of the visual attention measure and so future research should consider placing more restrictions on eye-movements to increase accuracy, though this may reduce the ecological validity of the findings.

The qualitative findings demonstrate a wide range of descriptions with regards to how individuals believe they were coming across, with many reportedly seeing negative aspects of the self in the video feed as well as within their description of their mental imagery. As mentioned previously, this is in accordance with Moscovitch's (2009) framework, which has shown that individuals with SA may demonstrate heterogeneous fears. A shortcoming in the present study's design is that it did not

explore the specific fears that participants held regarding the online video interaction, nor did it place restrictions on the content of the conversation, thus, there may have been aspects of the conversation content that could have elicited more anxiety for some individuals compared to others. This is important in light of Vriends and colleagues' (2017) findings which showed that when the conversation partner became critical it impacted on where the participant's attention was directed on screen. Future research could investigate individual symptom profiles in greater detail to explore what it is that individuals particularly fear about the online video interactions and explore what is driving such anxieties. In addition, further investigation could explore how specific fears might impact on the measured variables within the study and whether they are activated differently when the self-video is present or absent. A more thorough examination of the intricacies of anxiety in an online setting would assist in advancing knowledge into this area to allow treatment protocols to assess and intervene on an individual level, whilst holding in mind contextual influences.

A key consideration that was not focused on within the present study is the idea that social fears may be embedded within cultural biases of what it may mean to look anxious or come across badly to others. Instead, the emphasis of the study was entirely from a CBT perspective, which places psychological differences at an individual level. However, as humans we do not operate in isolation and we live as part of social groups, which shape how we develop and understand the world. Specifically, social expectations are rooted within cultures and so constructions of SA may be dependent on cultural or social contexts. In fact, recent research by Vriends and colleagues (2016) has shown that the effect of SFA in SA is dependent on one's self-construal and this differs between western and eastern cultures. Thus, a heightened focus on an individual perspective may have restricted our understanding of SA, and how it presents in an

online setting. An important future direction would be to explore whether one's self-construal may impact on factors that maintain SA in an online context.

Overall, the present study builds upon the growing literature dedicated to understanding how SA may present in an online environment. Although the Internet-delivered programme designed by Stott and colleagues (2013) incorporates its own video conferencing software and the current study utilised Skype, both applications are comparable in that they include a video feed of the conversation partner alongside a video of the self. An initial future direction would be to extend the present work to a clinical population preferably using the video conferencing software incorporated in the Internet-delivered programme to increase the applicability of the findings to clinical practice. Nevertheless, the present study's findings provide preliminary evidence that individuals who are socially anxious in face-to-face settings continue to experience SA in an online video context.

Fairburn and Patel (2017) have reflected on how a number of Internet-delivered programmes have been developed for various psychological disorders, such as depression, and that online mediums present enormous potential to circumvent many of the barriers to engaging in face-to-face interventions, such as stigma and embarrassment. However, little research has investigated how engagement differs between face-to-face interventions and those delivered over the Internet. In light of the present study's findings, which suggest that individuals with HSA continue to feel anxious online it may be interesting for future research to explore the degree to which this creates a barrier to engagement to interventions. It may also be fruitful to explore how individuals with other psychological disorders engage with online video communications, as the development of Internet based programmes will see service-users with a range of disorders communicating online with their therapist. An initial

direction would be to investigate this with individuals experiencing depression, given the number of overlapping constructs between depression and SAD (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Furthermore, it would be interesting to replicate the project within an adolescent population given that SAD has a median age of onset of 13 years (NICE, 2013).

4.5 Conclusion

The present study explored how individuals with HSA and LSA engaged in an online video interaction and whether having the self-video present or absent during the conversation had an impact on this. More specifically, a focus was placed upon exploring specific processes, which are proposed to maintain SA in face-to-face settings.

The findings suggest that those who are higher in SA experience SFA, socially anxious thoughts, anxiety and negative self-perceptions to a greater degree than those with LSA. This provides support for the Clark and Wells (1995) model in online settings and has implications for the assessment, formulation and intervention of SAD. The findings also suggest that the presence of the self-video increases SFA, socially anxious thoughts and reduces fixations on the conversation partner's face in both the HSA and LSA groups. This is the first evidence that has demonstrated that numerous maintenance components of SA are activated during an online video interaction and that the presence on the self-video can have a differential effect on some but not other processes. Furthermore, it has provided a preliminary insight into how participants interpret what they 'see' when they view themselves in a self-video and what they view in their mind's eye regarding how they are coming across during an online video conversation.

If the findings can be replicated within a clinical sample, there may be a number of implications for interventions for SAD in both face-to-face and Internet-delivered settings. Moreover, the study has demonstrated a promising paradigm for future studies to utilise when exploring SA within online settings. Further investigation is imperative to develop a deeper and more nuanced understanding of how SA presents in an ever-evolving world that increasingly relies on computerised technology to facilitate social interactions.

REFERENCES

Aderka, I. M. (2009). Factors affecting treatment efficacy in social phobia: The use of video feedback and individual vs. group formats. *Journal of Anxiety Disorders, 23*(1), 12-17.

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217-237.

Alden, L. E., & Mellings, T. M. (2004). Generalized social phobia and social judgments: The salience of self-and partner-information. *Journal of Anxiety Disorders, 18*(2), 143-157.

Alden, L. E., & Wallace, S. T. (1995). Social phobia and social appraisal in successful and unsuccessful social interactions. *Behaviour Research and Therapy, 33*(5), 497-505.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders, (DSM-5)*. London: American Psychiatric Publishing.

Amin, N., Foa, E. B., & Coles, M. E. (1998). Negative interpretation bias in social phobia. *Behaviour Research and Therapy, 36*(10), 945-957.

Andersson, G. (2009). Using the Internet to provide cognitive behaviour therapy. *Behaviour Research and Therapy, 47*(3), 175-180.

Ashbaugh, A. R., Antony, M. M., McCabe, R. E., Schmidt, L. A., & Swinson, R. P. (2005). Self-evaluative biases in social anxiety. *Cognitive Therapy and Research, 29*(4), 387-398.

Baker, S. R., & Edelmann, R. J. (2002). Is social phobia related to lack of social skills? Duration of skill-related behaviours and ratings of behavioural adequacy. *British Journal of Clinical Psychology, 41*(3), 243-257.

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open, 2*, 8-14.

Berg, B., & Lune, H. (2013). An Introduction to Content Analysis (8th ed.). MA: Allyn & Bacon.

Boehme, S., Miltner, W. H., & Straube, T. (2015). Neural correlates of self-focused attention in social anxiety. *Social Cognitive and Affective Neuroscience, 10*(6), 856-862.

Bögels, S., & Lamers, C. (2002). The causal role of self-awareness in blushing-anxious, socially-anxious and social phobics individuals. *Behaviour Research and Therapy, 40*(12), 1367-1384.

Bögels, S., & Zigterman, D. (2000). Dysfunctional cognitions in children with social phobia, separation anxiety disorder, and generalized anxiety disorder. *Journal of Abnormal Child Psychology, 28*(2), 205-211.

Bögels, S. M., & Mansell, W. (2004). Attention processes in the maintenance and treatment of social phobia: hypervigilance, avoidance and self-focused attention. *Clinical Psychology Review, 24*(7), 827-856.

Bögels, S. M., Rijsemus, W., & De Jong, P. J. (2002). Self-focused attention and social anxiety: The effects of experimentally heightened self-awareness on fear, blushing, cognitions, and social skills. *Cognitive Therapy and Research, 26*(4), 461-472.

Bolt, O. C., Ehlers, A., & Clark, D. M. (2014). Faces in a Crowd: High Socially Anxious Individuals Estimate that More People Are Looking at Them than Low Socially Anxious Individuals. *PLoS One, 9*(9), e106400.

Bradley, B. P., Mogg, K., & Lee, S. C. (1997). Attentional biases for negative information in induced and naturally occurring dysphoria. *Behaviour Research and Therapy, 35*(10), 911-927.

Bruch, M. A., Gorsky, J. M., Collins, T. M., & Berger, P. A. (1989). Shyness and sociability reexamined: A multicomponent analysis. *Journal of Personality and Social Psychology, 57*(5), 904.

Buckner, J. D., Maner, J. K., & Schmidt, N. B. (2010). Difficulty disengaging attention from social threat in social anxiety. *Cognitive Therapy and Research, 34*(1), 99-105.

Buss, D. M., & Scheier, M. F. (1976). Self-consciousness, self-awareness, and self-attribution. *Journal of Research in Personality, 10*(4), 463-468.

Campbell, C. G., Bierman, K. L., & Molenaar, P. C. (2016). Individual day-to-day process of social anxiety in vulnerable college students. *Applied Developmental Science, 20*(1), 1-15.

Canvin, L. K., Janecka, M., & Clark, D. M. (2016). Focussing Attention on Oneself Increases the Perception of Being Observed by Others. *Journal of Experimental Psychopathology, 7*(2), 160.

Carlbring, P., Nordgren, L. B., Furmark, T., & Andersson, G. (2009). Long-term outcome of Internet-delivered cognitive–behavioural therapy for social phobia: A 30-month follow-up. *Behaviour Research and Therapy, 47*(10), 848-850.

Carr, A., & McNulty, M. (2016). *The handbook of adult clinical psychology: an evidence based practice approach*: Routledge.

Carruthers, S., Warnock-Parkes, E., & Clark, D. M. (Submitted). *Computers in Human Behavior*.

Carver, C. S., & Scheier, M. F. (1978). Self-focusing effects of dispositional self-consciousness, mirror presence, and audience presence. *Journal of Personality and Social Psychology, 36*(3), 324.

Chan, C., & 陳皓宜. (2011). Cognitive processes in social anxiety: a study of anticipatory processing, attentional biases and post-eventprocessing. *HKU Theses Online (HKUTO)*.

Clark, D. M. (2005). A cognitive perspective on social phobia. *The Essential Handbook of Social Anxiety for Clinicians*, 193-218.

Clark, D. M., Ehlers, A., Hackmann, A., McManus, F., Fennell, M., Grey, N., . . . Wild, J. (2006). Cognitive therapy versus exposure and applied relaxation in social phobia: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 74*(3), 568.

Clark, D. M., & McManus, F. (2002). Information processing in social phobia. *Biological Psychiatry, 51*(1), 92-100.

Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. *Social phobia: Diagnosis, Assessment, and Treatment, 41*(68), 00022-00023.

Coles, M. E., Turk, C. L., Heimberg, R. G., & Fresco, D. M. (2001). Effects of varying levels of anxiety within social situations: Relationship to memory perspective and attributions in social phobia. *Behaviour Research and Therapy, 39*(6), 651-665.

Deiters, D. D., Stevens, S., Hermann, C., & Gerlach, A. L. (2013). Internal and external attention in speech anxiety. *Journal of Behavior Therapy and Experimental Psychiatry, 44*(2), 143-149.

Dell'Osso, L., Abelli, M., Pini, S., Carlini, M., Carpita, B., Macchi, E., . . . Massimetti, G. (2014). Dimensional assessment of DSM-5 social anxiety symptoms among university students and its relationship with functional impairment. *Neuropsychiatric Disease and Treatment, 10*, 1325.

Dodge, C. S., Hope, D. A., Heimberg, R. G., & Becker, R. E. (1988). Evaluation of the Social Interaction Self-Statement Test with a social phobic population. *Cognitive Therapy and Research, 12*(2), 211-222.

Erwin, B. A., Turk, C. L., Heimberg, R. G., Fresco, D. M., & Hantula, D. A. (2004). The Internet: home to a severe population of individuals with social anxiety disorder? *Journal of Anxiety Disorders, 18*(5), 629-646.

Fairburn, C. G., & Patel, V. (2017). The impact of digital technology on psychological treatments and their dissemination. *Behaviour Research and Therapy, 88*, 19-25.

Fang, A., Sawyer, A. T., Asnaani, A., & Hofmann, S. G. (2013). Social mishap exposures for social anxiety disorder: an important treatment ingredient. *Cognitive and Behavioral Practice, 20*(2), 213-220.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191.

Fehm, L., Pelissolo, A., Furmark, T., & Wittchen, H.-U. (2005). Size and burden of social phobia in Europe. *European Neuropsychopharmacology, 15*(4), 453-462.

Fenigstein, A., & Carver, C. S. (1978). Self-focusing effects of heartbeat feedback. *Journal of Personality and Social Psychology, 36*(11), 1241.

Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics*: Sage.

Furmark, T., Tillfors, M., Marteinsdottir, I., Fischer, H., Pissiota, A., Långström, B., & Fredrikson, M. (2002). Common changes in cerebral blood flow in patients with social phobia treated with citalopram or cognitive-behavioral therapy. *Archives of General Psychiatry, 59*(5), 425-433.

Gamble, A. L., & Rapee, R. M. (2010). The time-course of attention to emotional faces in social phobia. *Journal of Behavior Therapy and Experimental Psychiatry, 41*(1), 39-44.

Garner, M., Mogg, K., & Bradley, B. P. (2006). Orienting and maintenance of gaze to facial expressions in social anxiety. *Journal of Abnormal Psychology, 115*(4), 760-770.

Gershkovich, M. (2015). *A Randomized Trial of an Internet-Based Self-Help Intervention for Social Anxiety Disorder with and without Therapist Support.* Drexel University.

Grant, B. F., Hasin, D. S., Blanco, C., Stinson, F. S., Chou, S. P., Goldstein, R. B., . . . Huang, B. (2005). The epidemiology of social anxiety disorder in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *The Journal of Clinical Psychiatry, 66*(11), 1351-1361.

Griffiths, K. M. (2013). Towards a framework for increasing help-seeking for social anxiety disorder. *Australian and New Zealand Journal of Psychiatry*, 0004867413493335.

Hackmann, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in social phobia. *Behaviour Research and Therapy, 38*(6), 601-610.

Hackmann, A., Surawy, C., & Clark, D. M. (1998). Seeing Yourself Through Others'eyes: A Study Of Spontaneously Occurring Images In Social Phobia. *Behavioural and Cognitive Psychotherapy, 26*(01), 3-12.

Hans, E., & Hiller, W. (2013). A meta-analysis of nonrandomized effectiveness studies on outpatient cognitive behavioral therapy for adult anxiety disorders. *Clinical Psychology Review, 33*(8), 954-964.

Harvey, A. G., Clark, D. M., Ehlers, A., & Rapee, R. M. (2000). Social anxiety and self-impression: cognitive preparation enhances the beneficial effects of video feedback following a stressful social task. *Behaviour Research and Therapy, 38*(12), 1183-1192.

Hedman, E., Ljótsson, B., Kaldo, V., Hesser, H., El Alaoui, S., Kraepelien, M., . . . Andersson, G. (2014). Effectiveness of Internet-based cognitive behaviour therapy for depression in routine psychiatric care. *Journal of Affective Disorders, 155*, 49-58.

Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2010). A cognitive-behavioral model of social anxiety disorder: Update and extension. *Social Anxiety: Clinical, Developmental, and Social perspectives, 2*, 395-422.

Heimberg, R. G., Dodge, C. S., Hope, D. A., Kennedy, C. R., Zollo, L. J., & Becker, R. E. (1990). Cognitive behavioral group treatment for social phobia: Comparison with a credible placebo control. *Cognitive Therapy and Research, 14*(1), 1-23.

Herbert, J. D., & Forman, E. M. (2011). The evolution of cognitive behavior therapy. *Acceptance and Mindfulness in Cognitive Behavior Therapy*, 1.

Hirsch, C., Meynen, T., & Clark, D. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory, 12*(4), 496-506.

Hirsch, C. R., Clark, D. M., Mathews, A., & Williams, R. (2003). Self-images play a causal role in social phobia. *Behaviour Research and Therapy, 41*(8), 909-921.

Hodson, K. J., McManus, F. V., Clark, D. M., & Doll, H. (2008). Can Clark and Wells'(1995) cognitive model of social phobia be applied to young people? *Behavioural and Cognitive Psychotherapy, 36*(04), 449-461.

Hofmann, S. G., & Heinrichs, N. (2003). Differential effect of mirror manipulation on self-perception in social phobia subtypes. *Cognitive Therapy and Research, 27*(2), 131-142.

Homer, S. R., Deeprose, C., & Andrade, J. (2016). Negative mental imagery in public speaking anxiety: Forming cognitive resistance by taxing visuospatial working memory. *Journal of Behavior Therapy and Experimental Psychiatry, 50*, 77-82.

Hope, D. A., Gansler, D. A., & Heimberg, R. G. (1989). Attentional focus and causal attributions in social phobia: Implications from social psychology. *Clinical Psychology Review, 9*(1), 49-60.

Hulme, N., Hirsch, C., & Stopa, L. (2012). Images of the self and self-esteem: do positive self-images improve self-esteem in social anxiety? *Cognitive Behaviour Therapy, 41*(2), 163-173.

Ingram, R. E. (1990). Self-focused attention in clinical disorders: review and a conceptual model. *Psychological Bulletin, 107*(2), 156.

Katzelnick, D. J., & Greist, J. H. (2001). Social anxiety disorder: An unrecognized problem in primary care. *The Journal of Clinical Psychiatry*.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 593-602.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., . . . Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM-III-R

psychiatric disorders in the United States: results from the National Comorbidity Survey. *Archives of General Psychiatry, 51*(1), 8-19.

Kim, H.-Y., Lundh, L.-G., & Harvey, A. (2002). The enhancement of video feedback by cognitive preparation in the treatment of social anxiety. A single-session experiment. *Journal of Behavior Therapy and Experimental Psychiatry, 33*(1), 19-37.

Knappe, S., Beesdo, K., Fehm, L., Lieb, R., & Wittchen, H.-U. (2009). Associations of familial risk factors with social fears and social phobia: evidence for the continuum hypothesis in social anxiety disorder? *Journal of Neural Transmission, 116*(6), 639-648.

Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric Annals, 32*(9), 509-515.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The Phq-9. *Journal of General Internal Medicine, 16*(9), 606-613.

Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social Psychology Bulletin, 9*(3), 371-375.

Lecrubier, Y., Wittchen, H.-U., Faravelli, C., Bobes, J., Patel, A., & Knapp, M. (2000). A European perspective on social anxiety disorder. *European Psychiatry, 15*(1), 5-16.

Ledley, D. R., Heimberg, R. G., Hope, D. A., Hayes, S. A., Zaider, T. I., Van Dyke, M., . . . Fresco, D. M. (2009). Efficacy of a manualized and workbook-driven individual treatment for social anxiety disorder. *Behavior Therapy, 40*(4), 414-424.

Lydiard, R. B. (2001). Social anxiety disorder: Comorbidity and its implications. *The Journal of Clinical Psychiatry*.

Mansell, W., & Clark, D. M. (1999). How do I appear to others? Social anxiety and processing of the observable self. *Behaviour Research and Therapy, 37*(5), 419-434.

Mansell, W., Clark, D. M., & Ehlers, A. (2003). Internal versus external attention in social anxiety: An investigation using a novel paradigm. *Behaviour Research and Therapy, 41*(5), 555-572.

Mayo-Wilson, E., Dias, S., Mavranezouli, I., Kew, K., Clark, D. M., Ades, A., & Pilling, S. (2014). Psychological and pharmacological interventions for social anxiety disorder in adults: a systematic review and network meta-analysis. *The Lancet Psychiatry, 1*(5), 368-376.

McCord, B., Rodebaugh, T. L., & Levinson, C. A. (2014). Facebook: Social uses and anxiety. *Computers in Human Behavior, 34*, 23-27.

McManus, F., Clark, D. M., Grey, N., Wild, J., Hirsch, C., Fennell, M., . . . Manley, J. (2009). A demonstration of the efficacy of two of the components of cognitive therapy for social phobia. *Journal of Anxiety Disorders, 23*(4), 496-503.

McManus, F., Sacadura, C., & Clark, D. M. (2008). Why social anxiety persists: An experimental investigation of the role of safety behaviours as a maintaining factor. *Journal of Behavior Therapy and Experimental Psychiatry, 39*(2), 147-161.

Mills, A. C., Grant, D. M., Judah, M. R., & White, E. J. (2014). The influence of anticipatory processing on attentional biases in social anxiety. *Behavior Therapy, 45*(5), 720-729.

Miloff, A., Marklund, A., & Carlbring, P. (2015). The Challenger app for social anxiety disorder: New advances in mobile psychological treatment. *Internet Interventions, 2*(4), 382-391.

Mörtberg, E., Hoffart, A., Boecking, B., & Clark, D. M. (2015). Shifting the focus of one's attention mediates improvement in cognitive therapy for social anxiety disorder. *Behavioural and Cognitive Psychotherapy, 43*(01), 63-73.

Moscovitch, D. A. (2009). What is the core fear in social phobia? A new model to facilitate individualized case conceptualization and treatment. *Cognitive and Behavioral Practice, 16*(2), 123-134.

Moscovitch, D. A., Gavric, D. L., Merrifield, C., Bielak, T., & Moscovitch, M. (2011). Retrieval properties of negative vs. positive mental images and autobiographical memories in social anxiety: outcomes with a new measure. *Behaviour Research and Therapy, 49*(8), 505-517.

Moscovitch, D. A., & Hofmann, S. G. (2007). When ambiguity hurts: Social standards moderate self-appraisals in generalized social phobia. *Behaviour Research and Therapy, 45*(5), 1039-1052.

Moscovitch, D. A., Rowa, K., Paulitzki, J. R., Ierullo, M. D., Chiang, B., Antony, M. M., & McCabe, R. E. (2013). Self-portrayal concerns and their relation to safety behaviors and negative affect in social anxiety disorder. *Behaviour Research and Therapy, 51*(8), 476-486.

Ng, A. S., Abbott, M. J., & Hunt, C. (2014). The effect of self-imagery on symptoms and processes in social anxiety: A systematic review. *Clinical Psychology Review, 34*(8), 620-633.

NICE. (2013). *Social anxiety disorder: Recognition, assessment and treatment (NICE Guidance No. CG159)*. Leicester The British Psychological Society.

Norton, A. R., & Abbott, M. J. (2016). Self-focused cognition in social anxiety: A review of the theoretical and empirical literature. *Behaviour Change, 33*(01), 44-64.

Norton, P. J., & Hope, D. A. (2001). Kernels of truth or distorted perceptions: Self and observer ratings of social anxiety and performance. *Behavior Therapy, 32*(4), 765-786.

Orr, E. M., & Moscovitch, D. A. (2010). Learning to re-appraise the self during video feedback for social anxiety: Does depth of processing matter?. *Behaviour research and therapy*, *48*(8), 728-737.

Papageorgiou, C., & Wells, A. (2002). Effects of heart rate information on anxiety, perspective taking, and performance in high and low social-evaluative anxiety. *Behavior Therapy, 33*(2), 181-199.

Parr, C. J., & Cartwright-Hatton, S. (2009). Social anxiety in adolescents: the effect of video feedback on anxiety and the self-evaluation of performance. *Clinical psychology & psychotherapy*, *16*(1), 46-54.

Perini, S. J., Abbott, M. J., & Rapee, R. M. (2006). Perception of performance as a mediator in the relationship between social anxiety and negative post-event rumination. *Cognitive Therapy and Research, 30*(5), 645-659.

Perowne, S., & Mansell, W. (2002). Social anxiety, self-focused attention, and the discrimination of negative, neutral and positive audience members by their non-verbal behaviours. *Behavioural and Cognitive Psychotherapy, 30*(01), 11-23.

Pew, R. (2017). Social Media Fact Sheet. Retrieved from http://www.pewinternet.org/fact-sheet/social-media/.

Pineles, S. L., & Mineka, S. (2005). Attentional biases to internal and external sources of potential threat in social anxiety. *Journal of Abnormal Psychology, 114*(2), 314.

Prizant-Passal, S., Shechner, T., & Aderka, I. M. (2016). Social anxiety and internet use–A meta-analysis: What do we know? What are we missing? *Computers in Human Behavior, 62*, 221-229.

Rapee, R. M., Craske, M. G., & Barlow, D. H. (1994). Assessment instrument for panic disorder that includes fear of sensation-producing activities: The albany panic and phobia questionnaire. *Anxiety, 1*(3), 114-122.

Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy, 35*(8), 741-756.

Rapee, R. M., & Lim, L. (1992). Discrepancy between self-and observer ratings of performance in social phobics. *Journal of Abnormal Psychology, 101*(4), 728.

Rodebaugh, T. L. (2004). I might look OK, but I'm still doubtful, anxious, and avoidant: The mixed effects of enhanced video feedback on social anxiety symptoms. *Behaviour Research and Therapy, 42*(12), 1435-1451.

Rodebaugh, T. L., Heimberg, R. G., Schultz, L. T., & Blackmore, M. (2010). The moderated effects of video feedback for social anxiety disorder. *Journal of Anxiety Disorders, 24*(7), 663-671.

Ruscio, A. M. (2010). The latent structure of social anxiety disorder: Consequences of shifting to a dimensional diagnosis. *Journal of Abnormal Psychology, 119*(4), 662.

Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J., Stein, M. B., & Kessler, R. C. (2008). Social fears and social phobia in the USA: results from the National Comorbidity Survey Replication. *Psychological Medicine, 38*(01), 15-28.

Ryan, A., Warnock-Parkes, E., & Clark, D. M. (In Prep). How socially anxious people think and behave on Facebook.

Salkovskis, P. M. (1991). The importance of behaviour in the maintenance of anxiety and panic: A cognitive account. *Behavioural Psychotherapy, 19*(01), 6-19.

Schofield, C. A., Johnson, A. L., Inhoff, A. W., & Coles, M. E. (2012). Social anxiety and difficulty disengaging threat: Evidence from eye-tracking. *Cognition & Emotion, 26*(2), 300-311.

Schultz, L. T., & Heimberg, R. G. (2008). Attentional focus in social anxiety disorder: potential for interactive processes. *Clinical Psychology Review, 28*(7), 1206-1221.

Shalom, J. G., Israeli, H., Markovitzky, O., & Lipsitz, J. D. (2015). Social anxiety and physiological arousal during computer mediated vs. face to face communication. *Computers in Human Behavior, 44*, 202-208.

Spurr, J. M., & Stopa, L. (2002). Self-focused attention in social phobia and social anxiety. *Clinical Psychology Review, 22*(7), 947-975.

Spurr, J. M., & Stopa, L. (2003). The observer perspective: effects on social anxiety and performance. *Behaviour Research and Therapy, 41*(9), 1009-1028.

Stein, M. B., & Kean, Y. M. (2000). Disability and quality of life in social phobia: epidemiologic findings. *American Journal of Psychiatry, 157*(10), 1606-1613.

Stein, M. B., Torgrud, L. J., & Walker, J. R. (2000). Social phobia symptoms, subtypes, and severity: findings from a community survey. *Archives of General Psychiatry, 57*(11), 1046-1052.

Steinert, C., Hofmann, M., Leichsenring, F., & Kruse, J. (2013). What do we know today about the prospective long-term course of social anxiety disorder? A systematic literature review. *Journal of Anxiety Disorders, 27*(7), 692-702.

Stopa, L., & Clark, D. M. (1993). Cognitive processes in social phobia. *Behaviour research and therapy*, *31*(3), 255-267.

Stopa, L., & Clark, D. M. (2001). Social phobia: Comments on the viability and validity of an analogue research strategy and British norms for the fear of negative evaluation questionnaire. *Behavioural and Cognitive Psychotherapy, 29*(04), 423-430.

Stopa, L., & Jenkins, A. (2007). Images of the self in social anxiety: Effects on the retrieval of autobiographical memories. *Journal of Behavior Therapy and Experimental Psychiatry, 38*(4), 459-473.

Stott, R., Wild, J., Grey, N., Liness, S., Warnock-Parkes, E., Commins, S., . . . Ehlers, A. (2013). Internet-delivered cognitive therapy for social anxiety disorder: a development pilot series. *Behavioural and Cognitive Psychotherapy, 41*(04), 383-397.

Tanner, R. J., Stopa, L., & De Houwer, J. (2006). Implicit views of the self in social anxiety. *Behaviour Research and Therapy, 44*(10), 1397-1409.

Taylor, C. T., & Alden, L. E. (2008). Self–Related and Interpersonal Judgment Biases in Social Anxiety Disorder: Changes During Treatment and Relationship to Outcome. *International Journal of Cognitive Therapy, 1*(2), 125-137.

Trefflich, F., Kalckreuth, S., Mergl, R., & Rummel-Kluge, C. (2015). Psychiatric patients′ internet use corresponds to the internet use of the general public. *Psychiatry Research, 226*(1), 136-141.

Trew, J. L., & Alden, L. E. (2009). Predicting anger in social anxiety: The mediating role of rumination. *Behaviour Research and Therapy, 47*(12), 1079-1084.

Universities, U.K. (2016). Patterns and trends in UK higher education 2016. Retrieved from http://www.universitiesuk.ac.uk/facts-and-stats/data-and-analysis/Documents/patterns-and-trends-2016.pdf.

Vassilopoulos, S. P. (2005). Social anxiety and the vigilance-avoidance pattern of attentional processing. *Behavioural and Cognitive Psychotherapy, 33*(01), 13-24.

Voncken, M. J., Dijk, C., de Jong, P. J., & Roelofs, J. (2010). Not self-focused attention but negative beliefs affect poor social performance in social anxiety: An investigation of pathways in the social anxiety–social rejection relationship. *Behaviour Research and Therapy, 48*(10), 984-991.

Vriends, N., Bolt, O. C., Meral, Y., Meyer, A. H., Bögels, S., & Wilhelm, F. (2016). Does self-focused attention in social anxiety depend on self-construal? Evidence from a probe detection paradigm. *Journal of Experimental Psychopathology, 7*(1), 18-30.

Vriends, N., Meral, Y., Bargas-Avila, J. A., Stadler, C., & Bögels, S. M. (2017). How do I look? Self-focused attention during a video chat of women with social anxiety (disorder). *Behaviour Research and Therapy, 92*, 77-86.

Wallace, S. T., & Alden, L. E. (1991). A comparison of social standards and perceived ability in anxious and nonanxious men. *Cognitive Therapy and Research, 15*(3), 237-254.

Warnock-Parkes, E., Wild, J., Stott, R., Grey, N., Ehlers, A., & Clark, D. M. (2016). Seeing is believing: Using video feedback in cognitive therapy for Social Anxiety Disorder. *Cognitive and Behavioral Practice*.

Weeks, J. W., Heimberg, R. G., Rodebaugh, T. L., & Norton, P. J. (2008). Exploring the relationship between fear of positive evaluation and social anxiety. *Journal of Anxiety Disorders, 22*(3), 386-400.

Wegner, D. M., & Giuliano, T. (1980). Arousal-induced attention to self. *Journal of Personality and Social Psychology, 38*(5), 719.

Weidman, A. C., Fernandez, K. C., Levinson, C. A., Augustine, A. A., Larsen, R. J., & Rodebaugh, T. L. (2012). Compensatory internet use among individuals higher in social anxiety and its implications for well-being. *Personality and Individual Differences, 53*(3), 191-195.

Wells, A., Clark, D. M., & Ahmad, S. (1998). How do I look with my minds eye: Perspective taking in social phobic imagery. *Behaviour Research and Therapy, 36*(6), 631-634.

Wells, A., & Papageorgiou, C. (1999). The observer perspective: Biased imagery in social phobia, agoraphobia, and blood/injury phobia. *Behaviour Research and Therapy, 37*(7), 653-658.

Wells, A., Stopa, L., & Clark, D. (1993). The social cognitions questionnaire. *Unpublished, Department of Psychiatry, University of Oxford, Warnerford Hospital, Oxford, UK*.

Wild, J., Warnock-Parkes, E., Stott, R., Grey, N., Ehlers, A., & Clark, D. M. (In Prep). The Effectiveness of Video Feedback when Delivered in Internet Cognitive Therapy for Social Anxiety Disorder.

Wittchen, H.-U., & Beloch, E. (1996). The impact of social phobia on quality of life. *International Clinical Psychopharmacology, 11*, 15-23.

Woody, S. R. (1996). Effects of focus of attention on anxiety levels and social performance of individuals with social phobia. *Journal of Abnormal Psychology, 105*(1), 61.

Woody, S. R., Chambless, D. L., & Glass, C. R. (1997). Self-focused attention in the treatment of social phobia. *Behaviour Research and Therapy, 35*(2), 117-129.

Woody, S. R., & Rodriguez, B. F. (2000). Self-focused attention and social anxiety in

    social phobics and normal controls. *Cognitive Therapy and Research, 24*(4),

    473-488.

Zou, J. B., Hudson, J. L., & Rapee, R. M. (2007). The effect of attentional focus on

    social anxiety. *Behaviour Research and Therapy, 45*(10), 2326-2333.

APPENDICES

Appendix A: Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002)

<REMOVED FOR ONLINE VERSION>

Appendix B: Brief Fear of Negative Evaluation Scale (Leary, 1983)

<REMOVED FOR ONLINE VERSION>

Appendix C: The Albany Panic and Phobia Questionnaire Social Phobia Subscale (APPQSPS; Rapee, Craske & Barlow, 1994)

<REMOVED FOR ONLINE VERSION>

Appendix D: Online Screening Survey Information and Consent

Information and Consent Sheet: Attention and Online Interactions

Conducted by Sophia Seltzer-Eade, Doctoral Researcher

Thank you for your interest in the research study. Please read the following information carefully:

What is the study about?
The aim is to explore the psychological aspects of online social interactions. The study focuses on whether there are particular individual characteristics that influence the types of thoughts, feelings and behaviours that may arise during online video conversations.

What will the study involve?
There are two parts to this study: Part 1 is this 5-minute online screening survey.

If you fulfil the criteria you will be invited to participate in Part 2 based at the Psychology Department at Royal Holloway, University of London (RHUL). Where you will participate in a short Skype conversation with one of our research team, who is also a fellow student. This is being carried out at RHUL, as we would like your feedback throughout the conversation. The process will last no longer than 30 minutes.

All participants will be asked whether they would like to be entered into a prize draw to win one of four £15 Amazon vouchers. Participants in Part 2 will each receive £5.

Do I have to take part?
Taking part in the research is completely voluntary and you may withdraw from the study at any time, without giving a reason. You may decide to participate in Part 1 online but not Part 2. If you do not wish to answer a particular question, you may skip it. For students, your decision whether to take part (or not) will not affect your education in any way.

What are the risks of taking part?
There are not thought to be any specific risks associated with taking part in the research. However, if you feel worried or distressed during the study please feel free to contact the lead researcher and Trainee Clinical Psychologist, Sophia Seltzer-Eade (details below). A list of support services will be presented at the end of the survey.

Is it confidential?
Yes. Your information and responses will be kept completely confidential. You will be assigned a unique number to identify you throughout the study. All data will be stored in a password-protected database that only the research team will have access to. If you consent, your data may be used to answer future research questions, at which point ethics will be sought if required.

We will ask for you to provide an email address to be entered into the prize draw. In addition, the lead researcher may contact you on the email address you provide in Part 1, to invite you to Part 2 of the study. Your email addresses will be stored in a separate password-protected database from your responses; there will be no direct association between your email addresses and your responses.

What will happen to the results of the study?
The research will be submitted in partial fulfilment of a doctorate programme. We believe our findings will be of value to health care practitioners delivering interventions via the Internet and aim to publish its results in a peer-reviewed journal and in the scientific press. The published data will be anonymised and no participants will be identified. We will send you a summary of the findings via the email address you provide.

Who is organising and funding the research?
The research is being organised by Sophia Seltzer-Eade and is being funded by RHUL, as part of the doctorate programme in Clinical Psychology. This study has been reviewed and approved in accordance with the ethical procedure at RHUL.

Contacts for information
This project is supervised by Dr Dawn Watling (Royal Holloway) and Dr Emma Warnock-Parkes (University of Oxford).

You can contact Dr Dawn Watling or Sophia Seltzer-Eade before completing the first part of the study via the contact details below.

Sophia Seltzer-Eade, DClinPsy Researcher, email
Dawn Watling, Senior Lecturer, email , Tel

Thank you very much for taking the time to read the information sheet. If you are happy to participate, please complete the consent form on the next page.

You have been asked to participate in a study about online video based social interactions, which is being carried out by Sophia Seltzer-Eade. In this first part you have been asked to complete a brief online survey with a small set of questionnaires. This should take approximately 5 minutes.

Have you (please tick):

	Yes	No	Not applicable
Read the Information about the study	O	O	O
Had the opportunity to ask questions?	O	O	O
Got satisfactory answers to your questions?	O	O	O
Understood that you're free to withdraw from the study at any time, without giving a reason and without it affecting your education?	O	O	O
Understood that your information will be kept confidential throughout the research process?	O	O	O

Do you agree to take part in the study?

Yes	No

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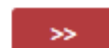
Appendix E: Online Screening Debrief Sheet (participants who did not meet inclusion criteria)

<u>Online Debrief Sheet: Attention and Online Interactions</u>

Thank you for taking part in the initial stages of this study. We very much appreciate you taking the time to fill out the survey and supporting us to understand the psychological aspects of online interactions.

Based on our selection process, **we do not require your participation in the next stage of the study (Skype conversation) at this time.** If you consent, you will be entered into a prize draw to win an amazon voucher.

What was the aim of the screening?
The overall aim of the research is to explore whether there are particular individual characteristics that influence people's thoughts, feelings and behaviours during online video interactions. We are not inviting all who participate in the initial screening to take part in the next stage as we have specific inclusion criteria.

We are interested in inviting individuals who differ on a number of measures to the next stage. This is to help us gain an understanding of how individuals with differing characteristics engage with and feel in online interactions.

If you would like to discuss any aspect of the research with Dr Dawn Watling you can contact her by email or by phone. If you would like to contact me, please email .
If you have any further questions please do not hesitate to ask.

Thank you once again for participating in this project and furthering our understanding of the topic!

Sophia Seltzer-Eade, DClinPsy Researcher

If you feel like you need extra support below are a list of contact numbers:

Further support contacts:

•   Samaritans 24-hour support free number: 116 123
•   RHUL College Counselling Services (9am-4pm Monday to Friday): Telephone: 01784 443 128, Email: counselling@royalholloway.ac.uk

If you are experiencing suicidal thoughts please attend your local GP practice to discuss support options available to you.

If you or someone else is in immediate danger or risk of harm phone 999 or present at your local A&E. They will be able to assess your presenting difficulties and provide you will appropriate support.

Appendix F: Online Screening Debrief Sheet (participants who met inclusion criteria for the main study)

Online Debrief Sheet: Attention and Online Interactions

Thank you very much for taking part in the first part of this study.

We are pleased to inform you that you are eligible to participate in the next stage of the research study and I kindly invite you to take part.

What happens next?
The next stage will take place in the Psychology Department at Royal Holloway, University of London (Egham). The whole process should take no longer than 30 minutes and we will reimburse you £5.00 for your time.

As mentioned previously, the aim of the research is to explore whether there are particular individual characteristics that influence the types of thoughts, feelings and behaviours that people experience during online video conversations. Therefore, the next stage involves a short conversation with one our researchers, who is a fellow student, over Skype.

This conversation is taking place at the Psychology Department at Royal Holloway. This is because we would like to monitor how participants engage during the conversation. To monitor this, we will be tracking eye movements using a non-intrusive eye tracker (you simply sit in front of the screen). Throughout the study we will ask participants about how they feel by completing short questionnaires.

What do I have to do?
You will be asked to provide a contact email address on the next page to be entered into the prize draw as a thank you for completing the first part of this study, and you will be able to indicate whether you consent to us contacting you to take part in the second part of this study. Your contact details will be stored in a separate database, so there will be no association between your email address and your responses during the research process. Please note that if you wish to be entered for the prize draw only and not be contacted to take part in the second stage of our study please let us know in your message.

Please proceed to the next page to input your email address to be entered into the prize draw as a thank you for completing the first part of this study, and/or to consent to us contacting you to take part in the second part of this study.

If you would like to discuss any aspect of the research with Dr Dawn Watling you can contact her by email or by phone. If you would like to contact me, please email.
If you have any further questions please do not hesitate to ask.

If you feel like you need extra support below are a list of contact numbers.
Thank you once again for participating in this project and furthering our understanding of the topic!

Sophia Seltzer-Eade, DClinPsy Researcher

Further support contacts:

• Samaritans 24-hour support free number: 116 123
• RHUL College Counselling Services (9am-4pm Monday to Friday): Telephone: 01784 443 128, Email: counselling@royalholloway.ac.uk

If you are experiencing suicidal thoughts please attend your local GP practice to discuss support options available to you.

If you or someone else is in immediate danger or risk of harm phone 999 or present at your local A&E. They will be able to assess your presenting difficulties and provide you will appropriate support.

Appendix G: Adapted Social Cognitions Questionnaire (SCQ; Wells, Stopa &Clark, 1993)

<REMOVED FOR ONLINE VERSION>

Appendix H: Anxiety and Performance Ratings

Please complete the following questions in relation to the conversation that you just had over Skype

How anxious were you during the conversation?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

On a scale of 0 (not at all anxious) to 100 (completely anxious)

How well do you think you came across to the other person during the conversation?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

On a scale of 0 (not very well at all) to 100 (very well)

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Appendix I: Self-Perception in the Self-Video

To what extent did you worry that you were being negatively judged because of the way you looked in the video?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

On a Scale of 0 (not at all) to 100 (very much)

Please evaluate how helpful it was to have the video of yourself present?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

On a scale of 0 (not at all helpful) to 100 (extremely helpful)

Please describe any similarities or differences regarding how you thought you were coming across during the conversation compared to what you actually saw during the video

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Appendix J: Self-Imagery Questions

Sometimes people have an image or picture in their mind of how they are coming across to the other person during social interactions. If you did experience an image or picture in your mind, please can you describe what this looked like?

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During the conversation, did you have an image or picture going through your mind ?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

On a scale of 0 (no image/picture) to 100 (an extremely clear image or picture)

If you did have a image/picture of yourself, please indicate below which statement which best describes the image/picture :

	Please choose one statement	
	As if you were seeing it through your own eyes, observing what was going on around you	As if you were observing yourself from an external point of view
The image/picture was:	O	O

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Appendix K: Focus of Attention Questionnaire Self-Focus Subscale (Woody, Chambless & Glass, 1997)
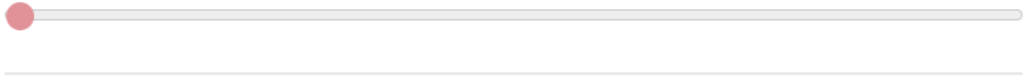
<REMOVED FOR ONLINE VERSION>

Appendix L: Self-Focused Attention Rating Scale

How much did you focus on yourself during the conversation?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

On a scale of 0 (I was totally externally focused on my conversation partner and my surroundings) to 100 (I was totally focused on my self during the conversation)

Appendix M: Information and Consent Sheet for Attention and Online Interactions (Main Study)

Information and Consent Sheet: Attention and Online Interactions

Researcher information: Sophia Seltzer-Eade, Doctoral researcher.
Thank you very much for taking part in the first part of this study (the online screening survey). I kindly invite you to take part in the second part of the study. It is important that you know why the research is being carried out and what the next stage involves before you decide whether to continue.

Please read this information carefully.

What will the study involve?
As mentioned previously, the aim of the research is to explore whether there are particular individual characteristics that influence the types of thoughts, feelings and behaviours that people experience during online video conversations. Therefore, the next stage involves a short conversation over Skype with one of the research team, who is a fellow student. Once you have given your consent to take part in the study we will ask you to have a conversation over Skype. Your conversation partner will be asking you some general questions about where you live and you can ask questions also to get to know a bit about where they are from. The topic of conversation may naturally move on to other areas and this is OK. Try to speak as if you were meeting someone for the first time.

We have asked you to come to the Psychology Department as we would like to monitor your eye movements during the Skype conversation (you simply sit in front of a screen). The lead researcher will set up the recording prior to the conversation. We will be stopping the conversation midway through and asking you to complete short questionnaires on the computer about how you feel. We will ask you to repeat this process at the end of the conversation.

Will my responses information be kept confidential?
As mentioned previously, your information will be kept completely confidential, with nobody except the research team having access to your responses or to the Skype video conversation, which will be recorded during the conversation. Your data will be stored in a password-protected database and you will be assigned a unique number to identify you throughout the research. Data will be securely stored and, if you consent

at the end of the study, may be used to answer future research questions. At which point additional ethics will be sought if required.

Do I have to take part?
Taking part in the research is completely voluntary and you may withdraw from the study at any time, without giving a reason. If you do not wish to answer a particular question, you may skip it. For students, your decision whether to take part (or not) will not affect your education in any way. Further, if you feel uncomfortable or do not wish to answer a particular questions you can skip them. If you decide not to take part you are still eligible to be entered for the prize draw from the first part you have completed.

What will happen to the results of the study?
The research will be written up and submitted in partial fulfilment of a doctorate programme. It is our objective to publish the results of this study in a relevant peer-reviewed journal and in the scientific press. This is because we believe our findings will be of interest to researchers and of value to health care practitioners delivering interventions via the Internet. The published data will be in anonymised form and there will be no risk of you being identified. We will send you a summary of the findings at the end if you consent to us contacting you.

Who is organising and funding the research?
The research is being organised by Sophia Seltzer-Eade and is being funded by Royal Holloway, University of London, as part of the Doctorate Programme in Clinical Psychology. This study has been reviewed and approved in accordance with the Ethical procedure at Royal Holloway, University of London.

Contacts
Please feel free to ask questions. if you feel worried or distressed during the study please let the lead researcher know.

This project is supervised by Dr Dawn Watling (Royal Holloway) and Dr Emma Warnock-Parkes (University of Oxford).

If you would like to discuss any aspect of the research with Dr Dawn Watling you can contact her by email or by phone. If you need to contact me, please email.

Thank you very much for considering participating in the project.

Appendix N: Debrief Sheet

<u>Debrief Sheet: Attention and Online Interactions</u>

Thank you very much for taking part in our study. We very much appreciate you taking the time to come to meet us on campus and for supporting us to understand the psychological aspects of online interactions.

The primary aim of the research was to explore the relationships between feelings of anxiousness in social situations with how people viewed their own performance (self-impression). We were also interested in investigating what individuals focused on during the conversation (was the focus on the self, or the conversation partner) and how they used the video of the self when it was present during the conversations through the eye-tracker.

Previous research has demonstrated that in face-to-face settings individuals with higher levels of social anxiety have a tendency to focus on themselves and have more negative judgements about their performance. We wanted to explore this in an online video context. There has been research to show that when individuals with higher levels of social anxiety are presented with a video recording of their social performance, a more positive self-impression is generated, along with reductions in self-focused attention and anxiety. We were interested to see if this occurred during a live video feed of the self.

A secondary aim of this research project is to develop a richer understanding of how we communicate in online interactions through recording the video conversation. We believe it will be an interesting follow-up investigation to map where participants attend to and whether certain shifts in attention are related to particular parts of the conversation. It will also be interesting to see if there are other signs in the interaction that may help us understand how those with differing levels of social anxiety respond in online interactions.

Through this research we are hoping to gain a greater understanding of the impact that individuals' feelings in social situations may have during online conversations. It is important to note that for this study we selected participants who demonstrated a variety of levels of social anxiety. Research has shown that in everyday populations there is a continuum for levels of social anxiety, which can be used to indicate how those with clinically diagnosed social anxiety may react. We aim to use this

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information as a starting point to begin to explore how we may strengthen Internet delivered psychological treatments for social anxiety (where individuals have a clinical level of anxious feelings in social situations).

We would like to thank you for your invaluable contribution in the study. As mentioned previously, if you have found any of the questions upsetting we would urge you to seek support through the college counselling services if you are a student at Royal Holloway on 01784 443128 or by contacting the Samaritans on 116 123 (this number is free to call). In an emergency please present at your local A&E service.

If you would like to discuss any aspect of the research with Dr Dawn Watling you can contact her by email or by phone. If you would like to contact me, please email.

Thank you once again for participating in this project.

Consent form for secondary aim of research project
Attention and Online Video Interactions

Through the debrief we have given additional information on the secondary aim of this work. This work is important so that we can gain knowledge and an understanding of how individuals use computer mediated communication and what the benefits or drawbacks may be of this for those who feel more or less anxious in social interactions. We would appreciate if you would provide consent for us to use the recordings of your conversation to further our understanding in this area. All recordings will be stored in password-protected files, and will be linked only to your ID number, never your name. Please can you respond to the following questions to provide consent for the research team to use this additional data;

Have you;

Read the information sheet about the study? **yes   no**
Had an opportunity to ask questions? **yes   no**
Got satisfactory answers to your questions? **yes   no**
Understood that you're free to withdraw from the study at any time, without giving a reason (and without it affecting your education)?   **yes   no**
Understood that your information will be kept confidential throughout the research process?   **yes   no**

Signature_____

        Name in block letters _____

Date_____

NB: This consent form will be stored separately from the anonymous information

In addition to the above consent, when we explain our findings to others it is helpful to show sections of recordings to illustrate what we mean. All recordings are anonymous. If you would be happy for your recordings to be used please provide your consent below. If you would not be happy for us to show any of your conversation, you do not need to do anything.

☐   Yes, I consent to my recording to being viewed when presenting research findings.

Signature_____

Name in block letters _____

Date:

Appendix O: Ethics Form

Ethics Review Details

You have chosen to self certify your project.	
Name:	Seltzer-Eade, Sophia (2007)
Email:	ZS IT145@live.rhul.ac.uk
Title of research project or grant:	Social Anxiety and Self-Focused Attention: The Effects of Online Video Interaction (Updated)
Project type:	Royal Holloway postgraduate research project/grant
Department:	Psychology
Academic supervisor:	Dr Dawn Watling
Email address of Academic Supervisor:	dawn.watling@rhul.ac.uk
Funding Body Category:	No external funder
Funding Body:	
Start date:	23/02/2016
End date:	24/07/17

Research question summary:

Internet delivered cognitive therapy for Social Anxiety Disorder (SAD) involves therapist and patient communication via video conferencing software. Research has investigated the effects of presenting retrospective video recordings of the self to individuals with SAD. However, no research has examined the effects of having a live video feed during an online video conversation. The present study will explore this gap in the literature with university students who score either high or low on a Social Anxiety measure.

We plan to compare participants' levels of anxiety, self-focused attention, self-ratings of performance and negative imagery between two Skype conversations: one with a live video feed of the self visible and one without. We also intend to explore how participants' use the live video feed during the conversations.

Specifically, the study aims to answer the following research questions:

The study aims to answer the following research questions:

• Do people with High Social Anxiety (HSA) spontaneously look at a video image of themselves more than people with Low Social Anxiety (LSA)?
• Do those individuals who spontaneously look at the self-video image more have higher or lower levels of self-focused attention?
• Do people with HSA and LSA become more or less self-focused when live VF is presented on screen compared to a condition without a video of themselves?
• Do people with HSA and LSA generate a more or less positive self-impression and experience more or less negative imagery when live VF is presented on screen?
• How do people with HSA and LSA use live VF when presented during a video conversation?

Research method summary:

Setting: The investigation will take place at the main Psychology department at RHUL.

Number of Participants: A power analysis has been conducted using G-power to find the most conservative sample size. We aim to recruit approximately 75-100 participants to take part in the study. Initial screening will most likely take place with approximately 250-300 participants.

Screening Process: Participants will take part in an initial screening process via Qualtrics. There will be two Social Anxiety measures: The Albany Panic and Phobia Questionnaire Social Phobia Subscale and the Brief Fear of Negative Evaluation Scale. Those scoring high and low on the measures will be allocated to two groups: high and low Social Anxiety. Participants scoring mid-range on the aforementioned measures will be excluded from taking part in the study. We will also exclude anybody experiencing suicidal ideation, indicated by the Patient Health Questionnaire - 9.

Study Task: Participants will engage in two conversations over Skype. In one condition a live video of the individual will be projected on the screen alongside a video of the conversation partner. In a second condition just a video of the conversation partner will be visible. The order of conditions will be counterbalanced. In addition, a Tobii eye tracker to detail how many times the individual looks at the self-video.

Post Study Task Questionnaires: After each conversation, Participants will be given a number of scales which have been used extensively in research. They will measure focus of attention e.g. Focus of Attention Questionnaire Self-focus sub scale, self-impression e.g. Social Cognitions Questionnaire and anxiety levels e.g. Subjective Units of Distress Scale. We also will be asking participants about how they 'used' the video it was present e.g. was what you saw in the video better or worse than you expected?

Risks to participants

Does your research involve any of the below?
Children (under the age of 16),
No

Participants with cognitive or physical impairment that may render them unable to give informed consent,
No

Participants who may be vulnerable for personal, emotional, psychological or other reasons,
Yes

Participants who may become vulnerable as a result of the conduct of the study (e.g. because it raises sensitive issues) or as a result of what is revealed in the study (e.g. criminal behaviour, or behaviour which is culturally or socially questionable),
No

Participants in unequal power relations (e.g. groups that you teach or work with, in which participants may feel coerced or unable to withdraw),
No

Participants who are likely to suffer negative consequences if identified (e.g. professional censure, exposure to stigma or abuse, damage to professional or social standing),
No

Details,
As mentioned in the research methods section, participants will be given the Patient Health Questionnaire-9 (PHQ-9) during the screening process to identify participants experiencing suicidal ideation. Those who score 1 or more on question 9 on the PHQ-9 'Thoughts that you would be better off dead or of hurting yourself in some way', will be excluded from the study and presented with a web page that will include telephone numbers of the Samaritans and will be encouraged to seek support from their GP.

Design and Data

Does your study include any of the following?

Will it be necessary for participants to take part in the study without their knowledge and/or informed consent at the time?,
No

Is there a risk that participants may be or become identifiable?,
No

Is pain or discomfort likely to result from the study?,
No

Could the study induce psychological stress or anxiety, or cause harm or negative consequences beyond the risks encountered in normal life?,
Yes

Does this research require approval from the NHS?,
No

If so what is the NHS Approval number,

Are drugs, placebos or other substances to be administered to the study participants, or will the study involve invasive, intrusive or potentially harmful procedures of any kind?,
No

Will human tissue including blood, saliva, urine, faeces, sperm or eggs be collected or used in the project?,
No

Will the research involve the use of administrative or secure data that requires permission from the appropriate authorities before use?,
No

Will financial inducements (other than reasonable expenses and compensation for time) be offered to participants?,
No

Is there a risk that any of the material, data, or outcomes to be used in this study has been derived from ethically-unsound procedures?,
No

Details,
It is acknowledged that the conversation tasks may induce anxiety, particularly as we are including a group of individuals who are considered to be experiencing high levels of Social Anxiety. However, the conversation tasks are considered to be on par with typical everyday conversations, and will focus on generic subject such as how much participants' like living where they live.

All participants will be made aware that they can withdraw at any point from the study without specifying a reason and they do not have to answer any questions that they do not wish to. If participants appear to become upset during the experiment they will be asked if they would like the testing to stop. In this situation, participants will be alerted to the campus counselling services and Samaritans help line.

Risks to the Environment / Society

Will the conduct of the research pose risks to the environment, site, society, or artifacts?,
No

Will the research be undertaken on private or government property without permission?,
No

Will geological or sedimentological samples be removed without permission?,
No

Will cultural or archaeological artifacts be removed without permission?,
No

Details,

Risks to Researchers/Institution

Does your research present any of the following risks to researchers or to the institution?

Is there a possibility that the researcher could be placed in a vulnerable situation either emotionally or physically (e.g. by being alone with vulnerable, or potentially aggressive participants, by entering an unsafe environment, or by working in countries in which there is unrest)?,
No

Is the topic of the research sensitive or controversial such that the researcher could be ethically or legally compromised (e.g. as a result of disclosures made during the research)?,
No

Will the research involve the investigation or observation of illegal practices, or the participation in illegal practices?,
No

Could any aspects of the research mean that the University has failed in its duty to care for researchers, participants, or the environment / society?,
No

Is there any reputational risk concerning the source of your funding?,
No

Is there any other ethical issue that may arise during the conduct of this study that could bring the institution into disrepute?,
No

Details,

Declaration

By submitting this form, I declare that the questions above have been answered truthfully and to the best of my knowledge and belief, and that I take full responsibility for these responses. I undertake to observe ethical principles throughout the research project and to report any changes that affect the ethics of the project to the University Research Ethics Committee for review.

Certificate produced for user ID, ZSJT145

Date:	04/10/2016 10:10
Signed by:	Seltzer-Eade, Sophia (2007)
Digital Signature:	Sophia Seltzer-Eade
Certificate dated:	10/4/2016 10:52:34 AM
Files uploaded:	Full-Review-255-2016-09-23-07-43-ZSJT145.pdf Online Information Sheet Qualtrics- All Participants.docx Online Debrief Sheet - High & Low Scores Continue to Main Study.docx Online Debrief Sheet - Excluded Mid Range Participants .docx Main Study Information Sheets.docx Main Study Debrief Sheets .doc Full-Review-255-2016-10-04-10-51-ZSJT145.pdf

Appendix P: Outlying Data Points

Outlying Data Points for Questionnaire Measures

Participant number	SA Group	Variable upon which the data point is outlying	> 3 SD's higher than variable mean	Action taken
27	LSA	Anxiety Rating (Self-Video On)	X	Winsorized
12	LSA	Anxiety Rating (Self-Video Off)	X	Winsorized
33	LSA	SCQ (Self-Video On)	X	Winsorized

Outlying Data Points for Eye-Tracking Data

Participant number	SA Group	Variable upon which the data point is outlying	> 3 SD's higher than variable mean	> 3 SD's lower than variable mean	Action taken
20	LSA	% Fixation Duration Face (Self-Video on)		X	Winsorized
10	LSA	% Fixation Duration Face (Self-Video off)		X	Winsorized
37	HSA	% Fixation Duration Face (Self-Video off)		X	Winsorized
20	LSA	%Fixation Duration on the Self-Video	X		Winsorized
35	HSA	% Fixation Duration on the Self-Video	X		Winsorized