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ORIGINAL ARTICLE

The Relationship Between Negative Self-imagery and Social Anxiety in a Clinically Diagnosed Sample

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Abstract

The current study aimed to investigate the content of negative self-imagery (NSI) in Social Anxiety Disorder (SAD) and to explore the relationship between NSI and other maintaining variables. Eighty-six individuals (83.7% female) with SAD completed self-report questionnaires and a semi-structured imagery interview. Thematic analysis was used to assess core themes from the interview transcripts. Mediation analyses were employed to explore the relationship between NSI and other variables of interest. Imagery characteristics supported extant findings, such that they appeared distorted, from an observer perspective, and inclusive of multiple sensory modalities. 'Unconditional beliefs' and 'Conditional beliefs' depicted overarching themes emerging from the data, outlining themes in NSI regarding self- and other-directed concepts. Mediation analyses demonstrated that imagery variables mediated the relationship between trait social anxiety and subsequent distress. Furthermore, socially-relevant beliefs mediated the relationship between trait social anxiety and NSI. These findings emphasise the clinical importance of targeting the meaning of social imagery and memories in SAD.

Keywords Social anxiety disorder · Negative imagery · Self · Beliefs · Imagery interview

Introduction

Social Anxiety Disorder (SAD) is a prevalent psychological disorder denoted by a marked, persistent fear of negative evaluation in social contexts (DSM-5; American Psychiatric Association [APA] 2013). Social interactions or performance-based activities can lead to severe levels of anxiety and increased fears of embarrassment and/or humiliation for an individual with SAD. Consequently, social situations are either avoided, or endured, despite significant distress (APA 2013). SAD is the most common anxiety disorder, presenting with a lifetime prevalence in Australia of 8.4% (Stein and Stein 2008; McEvoy et al. 2011). Many individuals with SAD suffer impairments across a broad range of life domains, including education, relationships, and employment, leading to reductions to their health-related quality of life (Schneier et al. 1994). As such, improving treatments for SAD by developing a stronger understanding of the mechanisms through which the disorder is maintained is pertinent.

Cognitive models for SAD propose a range of factors contributing to the perpetuation of the disorder (Clark and Wells 1995; Rapee and Heimberg 1997; Hofmann 2007; Heimberg et al. 2010). These include safety behaviours (e.g., avoidance), cognitions (e.g., negative self-beliefs), somatic symptoms (e.g., racing heart), self-focussed attention, and negative self-imagery (Clark and Wells 1995). Negative self-imagery (NSI) has been the focus of much research in recent years (Stopa and Jenkins 2007; Ng and Abbott 2014; Norton and Abbott 2016). Cognitive models of SAD posit that entering a feared social situation brings rise to self-focussed attention, whereby the individuals' focus on internal cues can include fixation on NSI and a distorted negative mental representation of the self. This negative self-representation, or image, is taken as evidence of how one is 'performing', which in turn heightens state anxiety and reinforces negative beliefs about the self, potentially resulting in poorer social performance (Norton and Abbott 2016). Recent reviews confirm the central role played by NSI in the maintenance of SAD (Ng and Abbott 2014).

Negative self-images are defined as mental representations of the self that appear spontaneously when an individual enters a feared social situation(s). These images portray an inaccurate or distorted picture of how the individual is

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perceived by others (Stopa 2009). Early qualitative investigations provide preliminary information regarding the form and content of such images as they present in SAD. Results of qualitative investigations found that NSI in SAD typically appears from an observer perspective, is partially distorted, and is predominantly visual in nature, although such images may also involve other sensory modalities (e.g., bodily sensations, sounds) (Hackmann et al. 1998, 2000). Evidence suggests that NSI is often associated with socially traumatic memories that elicit intense affective states (Hackmann et al. 2000; Wild et al. 2007). Socially traumatic memories involve negative social and peer-related experiences that threaten social belonging and connectedness, such as bullying, humiliation and ostracism (Norton and Abbott 2017). It has therefore been proposed that NSI not only affirms maladaptive beliefs about the self, but may also trigger fearful affective responses, further maintaining SAD.

The detrimental effects of NSI have been identified throughout the literature, such as increased SAD symptomatology, decreased self-esteem, and poorer social outcomes (Ng and Abbott 2014). Studies have found that holding in mind a negative self-image can lead to poorer performance on a public speaking task, a common fear among socially anxious individuals (Spurr and Stopa 2003; Makkar and Grisham 2011). Similar performance impediments have been noted during more common social tasks, such as maintaining a conversation. Hirsch et al. (2003) found that participants who held a negative self-image in mind during conversation, as opposed to a neutral image, exhibited poorer social performance as judged by an independent assessor. Not only was their social performance impaired, but these participants also reported higher levels of anxiety (Hirsch et al. 2003). The presence of NSI during socially-evaluative situations has also been associated with an increased use of safety behaviours (Hirsch et al. 2004). Across a variety of socially evaluative tasks, data indicates that participants who experience NSI are more likely to perceive their own social performance as poorer than ratings made by others, in addition to experiencing more negative thoughts (Hirsch et al. 2003, 2004; Makkar and Grisham 2011).

Negative and inaccurate self-perceptions following the presence of NSI may be consolidated into social and relational memories. Stopa and Jenkins (2007) explored the impact of negative imagery upon autobiographical memory, finding that positive memories were more difficult to retrieve after having held a negative self-image in mind, as opposed to a positive image. This study found that focusing on NSI was also associated with faster retrieval of negative memories (Stopa and Jenkins 2007). Taken together, these findings highlight the reinforcing nature of NSI in strengthening cognitive, behavioural and affective processes maintaining SAD.

Data indicates that there are associations between negative autobiographical memories and socially/relationally traumatic memories present in SAD (Norton and Abbott 2017). Given these associations linking thematic content of NSI with socially aversive autobiographical memories, recent research has explored the possibility of using imagery-based interventions, such as imagery rescripting (IR), in the treatment of SAD. IR aims to shift the meaning of beliefs associated with distressing or traumatic events towards more adaptive beliefs, via a process of visually revisiting and intervening in a traumatic, or aversive autobiographical memory (Arntz and Weertman 1999; Norton and Abbott 2017). Wild et al. (2007) provided initial evidence for a one-session IR intervention following a standardised cognitive behavioural treatment for SAD. Results displayed reductions in negative beliefs, image distress, memory distress and vividness that were maintained at follow-up (Wild et al. 2007). Following this preliminary study, evidence for the efficacy of IR interventions for SAD has continued to strengthen (Frets et al. 2014; Lee and Kwon 2013; McEvoy and Saulsman 2014; McEvoy et al. 2017; Nilsson et al. 2012; Norton and Abbott 2016; Reimer and Moscovitch 2015; Wild et al. 2008). A recent meta-analysis assessing the efficacy of IR across disorders revealed positive outcomes for its use for SAD (Morina et al. 2017). IR led to significant reductions in imagery and memory distress, vividness, negative memory appraisals, maladaptive beliefs, fear of negative evaluation, and overall SAD symptomatology resulting in improved social performance (Morina et al. 2017).

Early research identifying thematic associations between NSI and socially aversive memories has assisted in supporting the use of IR as an adjunctive treatment for SAD (e.g., Hackmann et al. 2000). However, research to date has not yet provided a thorough investigation of the thematic content of the NSI elicited to target such aversive social memories. Despite the continual focus on the use of imagery-focused treatments for SAD, knowledge of thematic content of NSI targeted in these interventions remains limited. Beyond the findings of Hackmann et al. (1998, 2000), there has been only one additional qualitative investigation, to the best of our knowledge, of thematic content in NSI. Homer and Deeprose (2017) identified several themes of NSI, including interacting with others, anxiety symptoms, performance anxiety, negative evaluation, public speaking, meeting new people, and unwanted attention. However, this study was limited by a small sample size, as well as the use of a computerised questionnaire to gather information, thus limiting participants' responses and imagery descriptions. There is a pressing need to better understand the nature of NSI as experienced by individuals with SAD, investigating not only thematic content, but also how such content may be associated with early memories of relational and social distress. Negative socially-relevant beliefs about the self have been implicated as an important construct in mediating this relationship via the interpretation of aversive socially

experiences (Clark and Wells 1995). Therefore, there is a need to better understand the relationships between NSI and other cognitive maintaining factors of the disorder (Ng and Abbott 2014), which would provide clinically useful information for imagery-focused interventions.

Therefore, the current study presented two broad aims through an investigation of NSI in SAD. First, we aimed to better understand the nature, content and characteristics (e.g., perspective of imagery, sensory modalities) of NSI in SAD within a clinically diagnosed sample. Second, we aimed to assess the relationship between trait social anxiety, NSI distress and associated autobiographical memory distress. A mixed method analysis was conducted, utilising data from self-report questionnaires in addition to image and memory descriptions elicited through a standardised face-to-face interview (Hackmann et al. 2000; Moscovitch et al. 2011). Qualitative analysis of NSI content aimed to build upon previous knowledge of thematic content. Themes were informed by core fears, underlying beliefs and assumptions depicted by cognitive models of SAD (Clark and Wells 1995) and guided by the semi-structured imagery interview format, thus distinguishing the level of qualitative analysis of NSI in the present study from previous imagery investigations. Quantitative analyses aimed to explore relationships between imagery-specific variables (e.g., vividness, frequency, control, distress), in addition to the relationships between NSI and other cognitive variables. It was hypothesised that, in accordance with prior findings (Hackmann et al. 1998, 2000), NSI would appear from an observer perspective, be experienced as distorted, and involve a range of sensory modalities.

In accordance with previous research associating imagery variables with increased distress, it was predicted that (1) the relationship between trait social anxiety and imagery/memory distress would be mediated by imagery variables (e.g., vividness). Furthermore, it was predicted that (2) the relationship between trait social anxiety and NSI would be cognitively mediated by negative self-beliefs that pertain to SAD.

Method

Participants

Participants consisted of 86 individuals (83.7% female) with a principal diagnosis of SAD, in accordance with the DSM-IV-TR/DSM-5 (APA 2000, 2013) criteria, as assessed by a doctoral level student with the Anxiety and Related Disorders Interview Schedule for DSM-IV-TR (ADIS-IV; DiNardo et al. 1994) and the Anxiety and Related Disorders Interview Schedule for DSM-5 (ADIS-5; Brown and Barlow 2014) under the supervision of senior clinical psychologists. Participants had a mean clinician severity rating of 6.0 (SD = 1.2) on a nine-point scale (from 0–8) for a diagnosis of Social Anxiety Disorder. Participants were also administered the Avoidant Personality Disorder section of the International Personality Disorder Examination for ICD-10 (Loranger et al. 1997). Participants were undergraduate psychology students who were recruited using two methods: (1) advertisement flyers, and (2) a mass screening of undergraduate psychology students to identify those scoring above 36 of the Social Interaction Anxiety Scale (SIAS; Mattick and Clarke 1998).[1]

Inclusion criteria required participants to be aged ≥ 18 years, and fulfil criteria for a principal diagnosis of SAD (see Norton and Abbott 2016, 2017). Comorbid diagnoses included Major Depressive Disorder (22.1%), Specific Phobia (19.8%), Generalised Anxiety Disorder (18.6%), Avoidant Personality Disorder (14%), other Anxiety Disorders (9.3%), Post-Traumatic Stress Disorder (8.1%), Eating Disorders (8.1%), and Body Dysmorphic Disorder (3.5%).

Measures

Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; DiNardo et al. 1994) and DSM-5 (ADIS-5; Brown and Barlow 2014; APA 2013)

Participants were administered the ADIS-IV/ADIS-5 (DiNardo et al. 1994; Brown and Barlow 2014) to determine diagnostic status. Both the ADIS-IV and ADIS-5 are semi-structured clinical interviews designed to assess diagnostic criteria of Axis I disorders based upon the DSM-IV and DSM-5, respectively. Interviews were video-taped for quality assessment purposes. Second rater coding of 15% of these interviews revealed 100% agreement for SAD diagnoses, $\kappa = 1.0$.[2]

Social Interaction Anxiety Scale (SIAS; Mattick and Clarke 1998)

The SIAS is a 20-item self-report measure that evaluates individual's fears of social interaction (Mattick and Clarke 1998). Participants complete the measure by selecting the most relatable response per item on a five-point Likert scale from 0 (not at all) to 4 (extremely). The scale displays sound psychometric properties, including high internal reliability and consistency, and adequate content and criterion validity (Modini et al. 2015). The internal consistency observed in the current sample was good, $\alpha = 0.75$.

[1] See Norton and Abbott (2016, 2017) for full details of recruitment strategies for the current sample.

[2] Agreement ratings from Norton and Abbott (2016, 2017).

Social Phobia Scale (SPS; Mattick and Clark 1998)

The SPS is a 20-item self-report measure that complements the SIAS, by assessing one's fears of being scrutinised when performing routine activities (Mattick and Clarke 1998). Response options are presented on a five-point Likert scale ranging from 0 (not at all) to 4 (extremely). The SPS has been shown to possess sound psychometric properties aligning with those of the SIAS (Modini et al. 2015). Internal consistency was excellent in the current study, $\alpha = 0.86$.

Brief Fear of Negative Evaluation Scale (BFNE; Leary 1983)

The BFNE is a 12-item self-report scale that evaluates one's fear of being negatively evaluated by others (Leary 1983). High scores on the scale are likely to indicate avoidance of situations where there is potential for negative evaluation from others. Respondents select a number between 1 (not at all characteristic of me) to 5 (extremely characteristic of me) for each item. The scale has been shown to hold sound psychometric properties (Leary 1983; Modini et al. 2015). Good internal consistency was revealed for the measure in the current sample, $\alpha = 0.69$.

The Depression Anxiety Stress Scales – Short Form (DASS-21; Lovibond and Lovibond 1995)

The DASS-21 is a 21-item self-report measure that assesses depression, anxiety and stress severity within the past seven days. Participants were required to select a response on a four-point scale ranging from 0 (not at all) to 3 (very much or most of the time). The DASS-21 has displayed sound psychometric properties (Lovibond and Lovibond 1995; Henry and Crawford 2005). Internal consistency was excellent in the current sample, $\alpha = 0.89$.

Self-Beliefs Related to Social Anxiety Scale (SBSA; Wong and Moulds 2011)

The SBSA is a 15-item self-report measure used to explore three types of maladaptive self-beliefs including high standard beliefs (e.g., "I have to appear intelligent and witty"), unconditional beliefs (e.g., "People think I am inferior") and conditional beliefs (e.g., "If I make mistakes, others will reject me") common in SAD, consistent with cognitive models (Wong et al. 2014; Wong and Moulds 2011; Clark and Wells 1995). Participants rated their response to each item on an 11-point scale ranging from 0 (do not agree at all) to 10 (strongly agree). The SBSA possesses good convergent and divergent validity, in addition to test–retest reliability and internal consistency (Wong and Moulds 2011). Excellent internal consistency was observed in the current sample, $\alpha = 0.86$.

Imagery Interview

Semi-structured imagery interviews completed by Norton and Abbott (2016, 2017) were based upon previous interview schedules exploring self-imagery and associated memories experienced by individuals with SAD (Hackmann et al. 2000; Moscovitch et al. 2011). The primary difference between the present and previous versions of the imagery interview is that we asked participants to rate various aspects of their images and memories (e.g., vividness, distress, frequency and control) and to identify a belief encapsulated in the image and memory. Imagery interviews aimed to elicit NSI as well as an associated memory through a standardised, fixed question format. The average length of imagery interviews was 30 min. Each imagery interview consisted of three phases: (1) Introduction to mental imagery and associated memories (2) Image recall and description, and (3) Memory recall and description.

During Phase 1, participants recalled their most feared social situation. They were then asked to close their eyes, and to imagine themselves in this feared situation. Following a brief introduction to, and definition of, self-imagery[3] (Moscovitch et al. 2011), Phase 2 commenced, whereby participants were asked to describe aloud the image of themselves. Participants were prompted for further details when necessary, for example; (i) are there other people in the image? (ii) what do you see in your face and body language? (iv) what emotions are you feeling?

Following their description of the image, participants were required to reflect on the meaning of their image by answering the following questions: (i) what does the image tell you about yourself as a person? (ii) what does the image tell you about other people? (iii) what does the image tell you about the world?

In Phase 3, participants were asked to recall the first time they experienced the same emotions as when recalling the image, in order to prime recollection of an associated memory (Norton and Abbott 2016). Once an associated memory was identified, participants were asked to describe aloud the details of this memory in first person, present tense. Finally, participants were asked to provide a brief statement that summarized the meaning of their image and memory.

Imagery and Memory Ratings Immediately following the description of their negative self-image and associated

[3] Self-imagery definition read to participants as follows: *People tend to describe these images as being like pictures or snapshots of themselves behaving or appearing a certain way; or images or snapshots of people they're interacting with or audience observers; or even snapshots of landscapes or scenes that seem frozen in time. Do any of these sound familiar to you?* Introduction based on interview schedule developed by Moscovitch et al. (2011).

Table 1 Phases of thematic analysis (Braun and Clarke 2006)

Phase	Description of process
1. Familiarisation with data	This phase includes transcription of interview recordings, reading transcriptions, and considering key components of interview content
2. Initial coding	Notating data with a list of initial codes (basic elements of meaning) within each transcript. Coding for the current study was completed through multiple processes, including coding by hand with a pen and paper method, as well as using a software program to collate codes which changed over time
3. Identification of themes	Following identification of initial codes, codes are compared to explore for overarching thematic content. Variations in initial coding can be used to better describe themes, which may later be identified as subthemes
4. Refining themes	Themes identified in the previous phase are reviewed and refined by re-reading data extracts for each theme to ensure they summarise a unique concept distinct from other themes. The relationship between themes is explored by determining the specific characteristics of each theme
5. Defining themes	Each theme should be provided with a definition that denotes its individual characteristics, as well as its relationship with other themes to portray an overall explanation of the dataset
6. Reporting results	The analysis has been conducted and the final report is written, including a description of themes, subthemes and their relationship(s). Results should provide evidence to support thematic content

Adapted from Braun and Clarke (2006, p. 87). Copyright 2006 by Qualitative Research in Psychology.

memory, participants were required to provide verbal ratings for several variables, including imagery vividness, frequency, control, as well as imagery distress and memory distress. All ratings were measured on a scale from 0 (not at all vivid; not at all frequent; not at all difficult to control; not at all distressing) to 100 (extremely vivid; extremely frequent; extremely difficult to control; extremely distressing). Participants also rated their summarizing belief from 0 (not at all true) to 100 (entirely true).

Procedure

Participants completed self-report measures (SIAS, SPS, BFNE, DASS-21; SBSA) to identify trait symptomatology and socially-relevant beliefs. Following questionnaire completion, participants were administered the diagnostic interview schedules (ADIS-IV or ADIS-5). The imagery interview was then administered, whereby participants provided verbal descriptions of their NSI and associated memory, in addition to imagery and memory ratings. All aspects of the study were approved by The University of Sydney Human Research Ethics Committee (#2013/216; #2014/647). All participants provided informed consent prior to commencing the study.

Qualitative Analyses

A mixed methods approach was undertaken, given the combination of exploratory and hypothesis-testing aims of the study. For the qualitative, exploratory components, thematic analysis was the chosen methodology, given its flexibility in both inductive and deductive components of interest, such as new themes emerging from the data, as well as how these relate to pre-existing imagery concepts (Braun and Clarke 2006). Thematic analysis was conducted in accordance with the six analytic phases described by Braun and Clarke (2006) (see Table 1). Thematic coding was completed using the qualitative data analysis software NVivo (QSR International PTY Ltd Version 11, 2012).

Efforts to ensure rigour of the thematic analysis included peer debriefing, providing clear descriptions of sample characteristics, use of verbatim excerpts to describe themes, and cross-coding by three colleagues (Beck 1993; Stanley and Nayar 2014; Chiovitti and Piran 2003). Coding meetings held with three independent coders facilitated the process of theme refinement until meeting thematic saturation (Glaser and Strauss 1967).

Quantitative Analysis—Coding Imagery Interview Ratings

Quantitative imagery variables were recorded including: length of image/memory description (measured in seconds) and participants' distress ratings when describing the relevant image (ranging from 0, no distress, to 100, extreme distress), or memory (ranging from 0, no distress, to 100, extreme distress). Participants' self-reports of image frequency, controllability, and vividness were also recorded (ranging from 0 to 100). In addition to subjective imagery ratings, objective ratings of imagery and memory distress were coded as they appeared to the rater (KD) (ranging from 0 no distress, to 100 extremely distressed).

Abstractness and Richness

For each image and memory description, participants' descriptions were rated on a five-point scale as outlined by Stöber (1998). In this scale, 1 = abstract, 2 = somewhat abstract, 3 = neither abstract nor concrete, 4 = somewhat concrete, 5 = concrete (Stöber et al. 2000). Abstractness ratings

reflected the extent to which image and memory descriptions incorporated non-realistic, distorted elements (e.g., self-image is black and white, magnified size of one's head). Similarly, each image and memory description was rated separately on a ten-point scale, ranging from 1 (simplistic; lack of richness) to 10 (extremely complex and detailed), where a richer image equated to one that was particularly detailed, included multiple sensory modalities and was comprehensive in detailing both foreground and background (central and peripheral) information.

Statistical Analyses

A computer generated random selection of 10% of imagery interviews were double-coded to assess agreeability for ratings of abstractness, richness, and distress in both image and memory descriptions. Reliability analyses were conducted to determine inter-rater reliability coefficients for these variables, involving calculation of intraclass correlation coefficient (ICC) estimates and related 95% confidence intervals (Koo and Li 2016).

Statistical analyses were completed using the Statistical Package for the Social Sciences software 22.0 for Windows. Significance was set at $\alpha = 0.05$ for all analyses. Multiple measures of social anxiety, socially-relevant beliefs and socially-relevant imagery were included to capture the depth and varied aspects of each construct adequately. Correlational analyses revealed significant portions of shared variance between several measures of social anxiety symptomatology (SIAS and SPS) ($r = 0.53$, $p < 0.01$), as well as quantitative imagery variables (ranging from $r = 0.42$ to 0.56). Consequently, composite scores were computed for (1) social anxiety symptomatology by summing the standardized SPS and SIAS scores (2) socially-relevant beliefs by summing standardized SBSA conditional and unconditional beliefs, strength of the combined image and memory belief, and the BFNE scores (3) imagery composite 1 by summing standardized imagery frequency, control and vividness ratings, and (4) imagery composite 2 by summing standardized imagery frequency, control, vividness and subjective distress ratings. The key difference between imagery composite 1 and imagery composite 2 is that the former uniquely assesses imagery characteristics, while the latter assesses both imagery characteristics and their impact (i.e., distress). Subjective image distress was not included in imagery composite 1, as this composite variable would be used to investigate the relationship between trait anxiety and imagery distress.

Mediation analyses were conducted testing several hypotheses regarding imagery and memory variables, in relation to experienced distress. These analyses adopted the Baron and Kenny (1986) method.[4] For each mediation analysis, significance of the mediated effect was assessed by the Sobel test (Sobel 1982). Mediation analyses were completed using multiple-regression analysis procedures. Relationships between imagery, memory and distress variables as tested via mediation in the current study are outlined in Fig. 1 (see "Results" section).

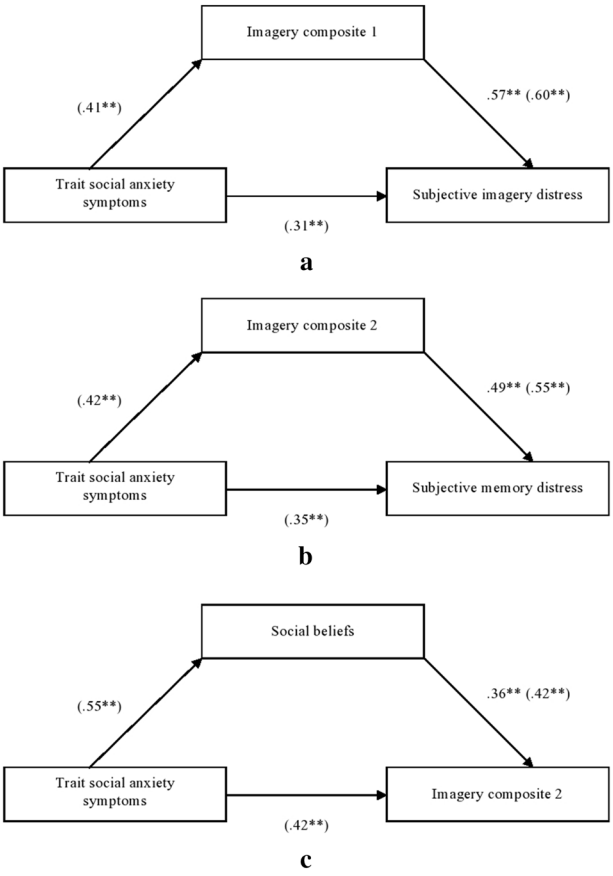

Fig. 1 Mediation models labelled 1a (imagery composite 1 as mediator), 1b (imagery composite 2 as mediator), and 1c (social beliefs as mediator). Numbers outside of parentheses depict standardized beta weights. Numbers inside parentheses indicate correlations. ** $p < 0.001$

Results

The mean age of participants was 20.91 years ($SD = 3.54$), and most participants were female (83.7%). Approximately half of participants were of Asian descent (52.3%), single (70.9%), undergraduate psychology students. Whilst all participants were partaking in tertiary level education at

[4] For conditions required for full mediation as outlined by Baron and Kenny (1986), refer to Norton and Abbott (2016).

Table 2 Type of memory associated with negative self-imagery

Memory type	Examples
Relational victimisation	Peer exclusion, bullying, cyberbullying, ostracism, racially-based ostracism
Overt victimisation	Physical abuse
Life transitions	Starting school, moving schools, moving countries
Unwanted relationship changes	Friends leaving one's peer group, parental divorce, romantic relationships ending
Humiliation from authority	Public shaming from teacher or employer in front of peers
Being evaluated	Public speaking, interpersonal skills evaluated at social functions, professional skills evaluated in the workplace
Family disapproval	Rejected by family due to personal qualities, close-other rejected by family

the time of the study, the majority of participants were in their first year of university (69.8%) and studying full-time (75.3%).

Trait Social Anxiety Symptomatology Descriptives

Means and standard deviations for measures specific to SAD, including the SIAS ($M = 42.62$, $SD = 9.77$) and the SPS ($M = 28.17$, $SD = 11.22$) exceed cut-off scores for a likely diagnosis of SAD (Peters 2000). Anxiety ($M = 12.14$, $SD = 8.70$) and stress ($M = 16.23$, $SD = 8.17$) subscale mean scores from the DASS-21 were also comparable to clinical SAD norms. DASS-21 depression subscale scores ($M = 12.47$, $SD = 10.03$) fell just below SAD treatment norms, however remained within one standard deviation of such norms (Antony et al. 2006). Similarly, the mean BFNE score ($M = 35.01$, $SD = 5.86$) was slightly below previously reported clinical SAD norms (Weeks et al. 2005). SBSA Unconditional beliefs mean scores ($M = 19.14$, $SD = 8.28$) were comparable to clinical SAD norms (Wong et al. 2014). Whilst means on SBSA conditional beliefs and high standard beliefs fell below prior SAD sample norms ($M = 35.37$, $SD = 14.85$; $M = 24.46$, $SD = 10.82$, respectively), they remained within one standard deviation of SAD treatment norms (Wong et al. 2014).

Socially Aversive Memories

The average age at which memories associated with negative self-images occurred was 14.21 years ($SD = 3.02$). The average length of participants' memory descriptions ($M = 81.60$ s, $SD = 61.39$) was significantly less than that of their image descriptions ($M = 107.66$ s, $SD = 55.55$), $t(83) = 4.08$, $p < 0.001$. The mean score for memory abstractness was 4.22 ($SD = 1.02$) and 5.80 ($SD = 2.41$) for memory richness. Objective memory distress ratings ($M = 58.12$; $SD = 22.87$) exceeded participants' subjective memory distress ratings ($M = 53.96$; $SD = 29.64$), however this difference was not statistically significant, $t(83) = 1.73$, $p = 0.09$.

Participants described a range of memories linked to their NSI, including memories of relational victimisation, overt victimisation, life transitions, unwanted relationship changes, and being evaluated. These types of associated memories, including specific examples, are outlined in Table 2.

Negative Self-Imagery

Type of Feared Social Situation Depicted in NSI

Types of social situations reported during the imagery interviews were consistent with those categorised in the DSM-5 (APA 2013), including 'social interactions', 'being observed', or 'performing in front of others'. The broader theme of 'social interactions' was depicted by various forms of interaction, including initiating conversation, maintaining conversation, meeting new people, or simply being in the presence of others whilst engaging in non-verbal interactions. Common settings for social interactions included bars, large social venues, schools, and workplaces. Dating situations involving social interaction, or speaking to an attractive other, were common reported social contexts.

'Being observed' was the most predominant theme regarding feared social situations, featuring in the majority of imagery interviews. Contexts where individuals reported observation from others as negative and/or unwanted included large crowds and schools. One third of participants' NSI depicted a performance-based social situation, most commonly public speaking.

Thematic Content of NSI

Thematic analysis (Braun and Clarke 2006) was adopted to explore thematic content in the imagery interview data. Table 3 summarises the thematic content of negative self-imagery interviews. Following iterative analyses and cross-coding procedures, two overarching themes emerged from the data, including 'Unconditional beliefs' (subthemes 'beliefs about self', and 'beliefs about others')

Table 3 Themes and subthemes identified in negative self-imagery transcript data

Theme	Description	Subthemes	Excerpt
Unconditional beliefs	This theme related to overarching beliefs about the self and others. Imagery interviews were rich in concrete statements about the self as inferior to others. For a subgroup of participants, negative unconditional self-beliefs appeared incongruent with their true self. That is, their true capabilities and qualities were not able to be expressed due to anxiety. In summary, the theme of unconditional beliefs forms two subsets of unconditional beliefs; negative beliefs about the self and negative beliefs about others	Beliefs about the self (weak, unworthy, inadequate, lazy)	*P4: I'm not interesting, I am boring* *P32: I'm intrinsically not enough, and I feel that I need to prove myself to others* *P43: The sense I get is that I'm torn, I don't want to be like this but I can't help it. Yeah, like a tension. Other people seeing this would [be seeing] a big weakness in me*
		Beliefs about others (others are judgmental, untrustworthy)	*P11: I perceive other people to be fine. They are confident and they don't have the same issues with anxiety that I do. They are superior* *P12: There's a picture of the other person. They've got that look on their face, like, "Oh my god, what is he doing?" They're kind of rolling their eyes at you, they kind of look away from you, and make a little expression like "what's he doing?" …you can tell from the way that they're behaving that they're just waiting for it to be over* *P29: I see people who are probably all judging me…thinking how stupid I am and how stupid I look* *P34: others are…judgmental and intimidating* *P43: Other people are very judgmental. This image says that everyone wants you to fail*
Conditional beliefs; discrepancy	Conditional beliefs, or discrepancy, is defined throughout imagery interviews as participants' beliefs regarding what one must do, or how one must 'be' in order to meet perceived social expectations. Expectations were described by participants as relating to one's performance abilities (e.g. public speaking; having a conversation), or one's character (e.g. an innately different personality to that of other socially-able individuals). This theme highlighted how participants believed that they fell short of perceived/expected standards such that the discrepancy between themselves and others always left them 'falling short' Common performance-based discrepancy examples include public speaking, conversational skills, use of humour, performing for an audience. Character-based discrepancies examples included personality 'flaws' separating the individual from others 'Conditional beliefs' is comprised of three subthemes; beliefs about observable anxiety, not meeting an inferred social standard (performance-based discrepancy), and not meeting an inferred internal standard (character-based discrepancy). Many participants reported both performance- and character-based discrepancies within their image description	Beliefs about observable anxiety (anxiety as weakness, anxiety as loss of control)	*P33: The image of myself is me flailing…very red face, hair going everywhere. I notice panic on my face. Blotchy neck, like red blotches. There's kind of a wild look in her eyes, like darting all around the room. I'm really fidgety…using the same hand gestures over and over again. Saying "um" a lot. Switching feet. And slouching. I'm aware of my face being really hot, my ears burning, being out of breath…tight chest, sweaty hands. Just feeling really alert…I'm constantly worried…because from their point of view if I was more intelligent and I knew what I was talking about, then I'd be able to convey that*
		Performance-based discrepancy	*P10: Other people are normal [and] I want to be like them. I want to be sociable, and I wish I could talk to somebody new comfortably, make friends easily* *P11: I have an image of me shrinking, and being really tiny…I'm going to look silly if I don't do anything and other people are going to see me and that I'm left out…Others are different to me and they don't have the same experience I have. I wish I was like them* *P48: I'm not normal. I don't have the social skills to participate in the same way as other people, I just don't know what to do in situations. I wasn't raised properly; I didn't learn how to be a proper human being*
		Character-based discrepancy	*P5: They're looking at me but in a sort of negative light. They're just, sort of, "who is she? What is she doing here?" sort of thing. I see confusion on their faces… looking down on me like I'm inferior* *P7: It would be most probably hearing them thinking. I'd hear most probably negative opinions. I would hear "she is anti-social and weird, awkward." "She is not intelligent enough."* *P32: my perception of myself isn't as great as I'd like to think. Even though I understand how I feel, I'd think that the character is really weak and they don't have any self-confidence. Also I feel like I couldn't really take the character seriously*

Themes outlined with a description, in addition to examples from transcript excerpts related to subthemes

Table 4 Negative self-imagery characteristics, associated affect and quantitative imagery variables

Characteristics of NSI	%/Mean (SD)
Image characteristics	
Observer perspective	100%
Distorted image	26%
Additional sensory modalities (sounds, smells, bodily sensations)	15%
Associated affect	
1. Anxious affect: anxiety, nervousness, embarrassment, uncertainty, worried, fearful	76%
2. Depressive affect: loneliness, disappointment, isolation, sadness, humiliation	10%
3. Angry affect: frustration, anger	5%
4. Positive affect: excitement, happiness	5%
5. Punitive affect (4%) described as: disgust, regret	4%
Quantitative NSI variables	
Length of response (s)	107.66 (55.55)
Vividness	69.25 (19.17)
Abstractness	3.49 (1.15)
Richness	6.14 (2.08)
Subjective image distress	55.91 (28.77)
Objective image distress	64.77 (18.91)
Frequency	41.21 (31.54)
Control	48.94 (31.47)

and 'Conditional beliefs/Discrepancy' (subthemes 'beliefs about observable anxiety', 'performance-based discrepancy' and 'character-based discrepancy'). Examples of themes and subthemes are also provided in Table 3.

Both thematic analyses of imagery content, in addition to statistical analyses of quantitative imagery variables, revealed the presence of imagery characteristics as reported in previous literature. These imagery characteristics are presented in Table 4, along with frequency of affect as reported by participants.

Inter-Rater Reliability

ICC estimates with 95% confidence intervals to evaluate reliability of double-coding from distress, abstractness and richness variables revealed a general pattern of acceptable reliability. ICCs for abstractness and richness across both image and memory variables ranged from 0.68 to 0.92, indicative of acceptable to high inter-rater reliability.[5] For objective imagery distress, there was evidence of good inter-rater reliability ($r = 0.79$, $p < 0.05$; $ICC = 0.89$, $p < 0.01$, 95% CI [0.50, 0.97]). However, ratings for objective memory distress indicated poor inter-rater reliability ($r = -0.07$, $p > 0.05$; $ICC = -0.18$, $p > 0.05$, 95% CI [− 8.40, 0.76]).

Correlations

Correlation analyses were conducted to explore the relationships between main variables of interest, including imagery/memory variables, as well as composite variables for trait social anxiety symptoms and social beliefs. These correlations are summarised in Table 5.[6] Overall, there was a pattern of moderate to high correlations between imagery and memory variables. Composite scores for trait social anxiety and trait social beliefs were both significantly positively correlated with imagery distress (subjective and objective ratings) and memory distress (subjective and objective ratings), but neither was significantly correlated with image or memory abstractness or richness. In addition, positive significant relationships were found between trait social anxiety and social belief composite scores and imagery vividness, frequency and control.

Mediation Analyses

In accordance with the specified hypotheses and previously reported significant correlations, three mediation models were tested (see Fig. 1). The first two models explored the possible mediating role of imagery variables, as measured by imagery composite 1 and imagery composite 2, respectively.

[5] Intraclass correlation coefficients for individual variables available on request.

[6] Correlations for all individual variables available on request; correlations with composite scores are presented throughout, though patterns of significance are equivalent to individual correlations.

Table 5 Correlations between symptom measures, imagery, and memory variables

	1	2	5	6	7	8	9	10	11	12	13	14	15
1. Trait social anxiety symptom composite	–												
2. Social beliefs composite	0.55**	–											
3. Imagery distress (subjective)	0.31**	0.43**	–										
4. Imagery distress (objective)	0.22*	0.38**	0.61**	–									
5. Imagery abstractness	0.12	−.05	0.01	− .13	–								
6. Imagery richness	0.04	0.09	0.11	0.23*	0.40**	–							
7. Imagery vividness	0.24*	0.25*	0.48**	0.20	0.10	0.08	–						
8. Imagery frequency	0.35**	0.34**	0.42**	0.31**	0.14	0.04	0.45**	–					
9. Imagery control	0.43**	0.51**	0.56**	0.38**	0.05	0.07	0.49**	0.56**	–				
10. Memory distress (subjective)	0.35**	0.47**	0.52**	0.37**	0.04	0.05	0.37**	0.37**	0.48**	–			
11. Memory distress (objective)	0.42**	0.54**	0.38**	0.57**	-.01	0.10	0.15	0.25*	0.46**	0.53**	–		
12. Memory abstractness	0.01	0.06	0.10	0.08	0.29**	0.34	0.15	0.07	0.06	0.01	0.11	–	
13. Memory richness	− .07	0.09	0.09	0.24*	0.24*	0.61**	0.10	-.02	0.02	0.03	0.11	0.64**	–

Individual correlations for symptoms and cognitive measures available upon request

The third model explored the role of social beliefs as a possible mediator in the relationship between trait social anxiety and imagery variables, as measured by imagery composite 2.

Model 1: NSI Mediates the Relationship Between Trait Social Anxiety Symptoms and Imagery Distress

Multiple regression analyses indicated a significant relationship between trait anxiety and imagery distress ($R^2 = 0.09$, $F(1,84) = 8.77$, $p < 0.01$), and a significant relationship between trait social anxiety symptoms and imagery composite 1 (as measured by image vividness, frequency and control) ($R^2 = 0.17$, $F(1,84) = 17.10$, $p < 0.01$). After controlling for trait social anxiety symptoms, a significant relationship remained between imagery composite 1 and imagery distress ($t = 5.88$, $\beta = 0.57$, $sr^2 = 0.52$, $p < 0.001$). Finally, when controlling for imagery composite 1, it was revealed that the relationship between trait social anxiety symptoms and imagery distress was no longer significant ($t = 0.78$, $\beta = 0.08$, $sr^2 = 00.07$, $p > 0.05$), thus providing further evidence for imagery composite 1 as mediating this relationship. The Goodman (I) version of the Sobel test demonstrated that this mediation effect was significant ($z = 3.41$, $p < 0.001$) (see Baron and Kenny 1986; Preacher and Leonardelli 2004).

Model 2: NSI Mediates the Relationship Between Trait Social Anxiety Symptoms and Memory Distress

Analyses revealed a significant relationship between trait social anxiety symptoms and memory distress ($R^2 = 0.13$, $F(1,83) = 11.86$, $p < 0.01$), and a significant relationship between trait anxiety and imagery composite 2 (as measured by image vividness, frequency, control and distress) ($R^2 = 0.17$, $F(1,84) = 17.72$, $p < 0.01$). After controlling for trait social anxiety symptoms, a significant relationship remained between imagery composite 2 and memory distress ($t = 4.84$, $\beta = 0.49$, $sr^2 = 0.44$, $p < 0.001$). Finally, when controlling for imagery composite 2, it was revealed that the relationship between trait social anxiety symptoms and memory distress was no longer significant ($t = 1.50$, $\beta = 0.15$, $sr^2 = 0.14$, $p > 0.05$). The Goodman (I) version of the Sobel test demonstrated that this mediation effect was significant mediation ($z = 3.48$, $p < 0.001$). Evidence of full mediation was supported.

The same mediation analysis was conducted, however with the substitution of imagery composite 1 rather than imagery composite 2. Results supported any individual imagery variable as a mediator between trait social anxiety symptoms and memory distress.

Model 3: Social Beliefs Mediate the Relationship Between Trait Social Anxiety Symptoms and NSI

Analyses revealed a significant relationship between trait social anxiety symptoms and imagery composite 2 ($R^2 = 0.17$, $F(1,84) = 17.72$, $p < 0.01$), and a significant relationship between trait social anxiety symptoms and social beliefs ($R^2 = 0.30$, $F(1,84) = 35.48$, $p < 0.01$). After controlling for trait social anxiety symptoms, a significant relationship remained between social beliefs and imagery composite 2 ($t = 3.25$, $\beta = 0.36$, $sr^2 = 0.31$, $p < 0.01$). Finally, when controlling for social beliefs, it was revealed that the relationship between trait social anxiety symptoms and imagery composite 2 was no longer significant ($t = 1.96$, $\beta = 0.22$, $sr^2 = 0.18$, $p > 0.05$). The Goodman (I) version of the Sobel test demonstrated that this mediation effect was significant mediation, with full mediation achieved ($z = 3.88$, $p < 0.001$).

Given the related measures used in each regression analyses, it was considered important to assess for high multicollinearity. Firstly, considering the range of correlations between regression variables as between 0.31 and 0.60, multicollinearity was unlikely. Secondly, variation inflation factors (VIF) and tolerance levels for all regression models fell within the accepted ranges of multicollinearity.[7]

Discussion

The current study broadly aimed to better understand the content of NSI in SAD and to assess relationships between social anxiety, socially-relevant beliefs, imagery and memory characteristics and distress amongst a sample of participants meeting the principal diagnostic criteria for SAD. The mixed methods approach allowed for a synthesis of qualitative and quantitative findings to build upon the current knowledge of NSI in SAD. As hypothesised, NSI appeared from an observer perspective for all participants. Additionally, participants' NSI often appeared distorted, and incorporated sensory modalities beyond the visual domain, including auditory and olfactory elements, however the frequency of such characteristics was less than expected based on previous studies (Hackmann et al. 2000). Results of mediation analyses also aligned with hypotheses. As predicted, the relationship between trait social anxiety and imagery/memory distress was mediated by imagery variables. Of significance were the results of the third mediation model, whereby socially-relevant beliefs mediated the relationship between trait social anxiety and NSI. These findings provide several implications regarding NSI in SAD that may inform cognitive models and clinical practice.

The current qualitative results further support findings from early studies conducted by Hackmann et al. (1998) as well as Hackmann et al. (2000). Imagery descriptions were all reported from an observer perspective, and many also presented as abstract, distorted self-representations involving sounds, smells, and tastes as well as visual components. Whilst these findings have been evidenced by early studies with smaller samples, the larger sample size in the current study endorses the broader generalisation of these findings beyond small-scale qualitative preliminary investigations to populations meeting the diagnostic criteria for SAD.

Results from the thematic analysis provided novel insights into the content of NSI. The two overarching themes emerged including 'Unconditional beliefs' and 'Conditional beliefs', which detailed the breadth of beliefs held about the self and others encapsulated by participants' NSI. 'Unconditional beliefs' highlighted the felt sense of inferiority in NSI, whereby the individual experiences themselves as weaker, lazier, and/or less worthy than others. 'Conditional beliefs' outlined the discrepancy evident in participants NSI regarding distinctions between their own character or social abilities in comparison to others, in feeling unable to meet a self-inferred or presumed social standard. These themes closely align with the self-schema identified in Clark and Wells' (1995) cognitive model of SAD, including unconditional beliefs about the self, and conditional beliefs about social evaluation, as well as those identified in quantitative measures of self-beliefs in SAD, such as the SBSA and the Core Beliefs Questionnaire (Wong and Moulds 2011; Wong et al. 2017).

Types of feared social situations identified in NSI were consistent with thematic content reported in more recent investigations of imagery in SAD amongst a subclinical sample (Homer and Deeprose 2017). For example, social interactions (e.g., conversations, meeting new people), being observed (e.g., in a crowd) and performing (e.g., public speaking) were commonly feared social situations depicted in participants' NSI that have also been reported as the context for imagery themes in other qualitative studies (Homer and Deeprose 2017). These types of social situations associated with NSI in the current study are compatible with recent investigations exploring types of feared social situations among individuals with SAD, ranging from mild public performance fears (e.g., public speaking), being assertive or attending parties, to more severe fears of eating or drinking in public (Crome and Baillie 2014). The majority of feared social situations in the current study were performance-based (e.g., public speaking). This finding may suggest that individuals with performance-based social fears may be more susceptible to NSI, or instead, dominant fears

[7] VIF levels exceeding 5 and tolerance levels less than 0.2 are considered indicative of high multicollinearity (Tabachnick and Fidell 2001; Perini et al. 2006). Such levels were not evident in the reported regression models.

may be predominantly associated with NSI, whether they are performance-based or not. These possibilities warrant further investigation.

Qualitative results also provided information regarding the types of socially aversive events depicted in participant's associated autobiographical memories, including relationship victimisation, overt victimisation, life transitions, unwanted relationship changes, humiliation from authority, being evaluated, and family disapproval. The relational nature of these themes further supports the previous evidence of associations between socially aversive memories and NSI in SAD (Hackmann et al. 2000; Norton and Abbott 2017). Such socially aversive memories may act as predisposing factors consolidating social evaluative beliefs about the self and perceived tendency for critical feedback from others (Norton and Abbott 2017). For example, one participants' memory of overt victimisation related to negative beliefs, such as "People are judgemental and untrustworthy", and "I feel weak and need to be cautious of others". This finding may prove useful in informing clinical interventions targeting NSI and associated memories, for example IR for SAD.

Quantitative findings also have implications that inform conceptualisations of the nature of NSI in social anxiety. Mediation models one and two provided evidence for NSI variables (e.g., vividness, frequency, controllability) mediating the relationship between an individual's trait social anxiety, and the distress that was associated with either their NSI or its associated memory. The observed direct relationships between NSI characteristics (e.g., vividness, frequency, controllability) and trait social anxiety, as well as with distress, may be due to these characteristics heightening the aversiveness of NSI and its associated memory, particularly when experienced in a social or performance context, thus further enhancing the experience of anxious arousal. Taken together, these mediation models indicate the importance of considering imagery in assessing and intervening to reduce and individuals' level of distress. Such findings further assert the importance of incorporating imagery-focussed techniques in treatment programs for SAD, suggesting that direct targeting of imagery characteristics would likely reduce distress.

Perhaps the most theoretically and clinically relevant finding resulted from the third mediation model, whereby social beliefs provided full mediation of the relationship between trait social anxiety and NSI (imagery composite 2). This finding emphasises the importance of beliefs as a key contributing factor to the relationship between overall social anxiety and aspects of NSI. More specifically, the interpretation and appraisal of important predisposing factors (i.e., relationally aversive memories) is likely encapsulated in the associated NSI experienced repeatedly during feared social and performance situations, consolidating underlying beliefs and assumptions relating to a negative self-concept, the likelihood and cost of negative evaluation, the enduring critical nature of others, as well as facilitating other maintaining factors such as self-focussed attention and safety strategy use. Given the associations between the NSI-related appraisals as stemming from aversive memories, interventions may be most effective when specifically connected with the memory in which the appraisal was formed, for example IR. These findings and their interpretation warrant further empirical investigation, including longitudinal studies, but remain consistent with the hypotheses of cognitive models of SAD (e.g., Clark and Wells 1995; Hofmann 2007).

Whilst the current results contribute new insights into the emerging field of NSI in SAD, there are several limitations that require discussion. First, the age and gender characteristics of the current sample may restrict the generalisability of the results, given that the majority of participants were young female adults at university. Future studies would benefit by recruiting a more diverse sample to capture broader ages, gender diversity, and education status. As such, future replications would benefit from inclusion of both a treatment seeking clinically anxious SAD sample and a nonclinical (control) sample. The comorbidity rates indicate a relatively complex and diverse group of participants, particularly given the rates of anxiety and unipolar mood disorders as well as those for eating disorders, however these are in keeping with previous research on populations with broader age characteristics (e.g., Swinbourne et al. 2012); Second, the design is correlational and thus future research would benefit from a longitudinal design where causal models could be tested; Third, issues regarding inter-rater reliability indicate difficulties in the accuracy of some ratings. Inter-rater reliability analyses for double-coded quantitative variables (image/memory abstractness, richness, and distress) were predominantly satisfactory. However, there was evidence of poor inter-rater reliability for rater's impressions of participants' level of distress experienced during memory descriptions. It appeared that rater's coding of participants' affect state, as indicated by subjective units of distress, was more reliable when observing participants' distress in recalling their NSI than their related autobiographical memory. It is possible that given the frequency and ease with which participants experienced their NSI in comparison to the associated memory, that participants' imagery-associated distress was more observable to raters than that experienced during memory recall. These results are consistent with extant literature stating the NSI are often recurring memory fragments from socially aversive events (Wild 2009). The higher frequency with which the NSI is experienced suggests the possibility that imagery is likely to have been processed further by the participant than the original memory from which is arose. Given the predominantly unprocessed nature of associated memories, participants' memory descriptions were shorter,

less descriptive, more withdrawn and likely involved fewer cognitive processes (Wild and Clark 2011). It is therefore more likely that independent raters may have more difficulty in reaching a consensus when coding observable affect or distress related to fragmented autobiographical memories, particularly when such memories have been avoided over the longer term.

Despite the aforementioned limitations, the current study contributes several strengths and insights for both theoretical understandings and empirical investigations of NSI in SAD. Recent reviews raised a pressing need for research investigating NSI in SAD to extend beyond analogue SAD samples to clinical populations through the use of diagnostic assessment tools during recruitment (Ng and Abbott 2014). The current study included a large ($N = 86$) sample of individuals with a principal diagnosis of SAD in accordance with standardized diagnostic interview schedules. Therefore, the results may be generalised more readily to a clinical SAD (treatment seeking) population. Furthermore, the depth and quality of imagery and memory descriptions as captured using a semi-structured interview allowed for richer descriptions of participants' experience of NSI beyond computerised questionnaires that have been used in recent SAD imagery investigations (Homer and Deeprose 2017).

Key findings include the contribution to the thematic content of NSI in SAD through identification of 'unconditional beliefs' and 'conditional beliefs', and highlighting the importance of socially-relevant beliefs as mediating the relationship between trait social anxiety and NSI characteristics. This finding emphasises the importance of aiming to restructure/reappraise maladaptive beliefs arising from one's NSI and to fully process the affect and meaning associated with predisposing autobiographical memories and related NSI in order to reduce their salience (Foa and Kozak 1986). Consequently, the results further support the importance of cognitive therapy and imagery-focussed interventions for SAD (Clark and Wells 1995; Rapee and Heimberg 1997; Hofmann 2007). In particular, treatment techniques that target the meaning associated with one's NSI and associated socially aversive memories, for example IR, are likely to assist in reducing distress.

The current study extends the empirical literature focussed on NSI in SAD. Identifying thematic content and its meaning can be the focus of clinical interventions targeting this form of imagery and associated early social memories. Imagery-related interventions such as imagery rescripting may enhance established evidence-based interventions specifically targeting negative imagery and its meaning via rescripting related memories and core beliefs. In this way, understanding and modifying the meaning of socially threatening images and memories shows promise in impacting maintaining and predisposing factors in SAD.

Compliance with Ethical Standards

Conflict of interest Katherine A. Dobinson, Alice R. Norton and Maree J. Abbott declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (national and institutional). Informed consent was obtained from all individual subjects participating in the study.

Animals Rights This article does not contain any studies with animals performed by any of the authors.

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