

Terror mismanagement: evidence that mortality salience exacerbates attentional bias in social anxiety

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ABSTRACT

Death anxiety is a basic fear underlying a range of psychological conditions, and has been found to increase avoidance in social anxiety. Given that attentional bias is a core feature of social anxiety, the aim of the present study was to examine the impact of mortality salience (MS) on attentional bias in social anxiety. Participants were 36 socially anxious and 37 non-socially anxious individuals, randomly allocated to a MS or control condition. An eye-tracking procedure assessed initial bias towards, and late-stage avoidance of, socially threatening facial expressions. As predicted, socially anxious participants in the MS condition demonstrated significantly more initial bias to social threat than non-socially anxious participants in the MS condition and socially anxious participants in the control condition. However, this effect was not found for late-stage avoidance of social threat. These findings suggest that reminders of death may heighten initial vigilance towards social threat.

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Death anxiety is regarded as a transdiagnostic construct underlying a range of psychological conditions, including depressive disorders, eating disorders, post-traumatic stress disorder (PTSD), obsessive compulsive disorder, and anxiety disorders (Furer & Walker, 2008; Iverach, Menzies, & Menzies, 2014). Of particular note, death anxiety is particularly evident across disorders characterised by anxious responding (Routledge et al., 2010; Strachan et al., 2007). For example, individuals with panic disorder frequently fear dying from a heart attack (Fleet & Beitman, 1998), compulsive hand washers often name life-threatening illnesses as playing a role in their anxiety (St Clare, Menzies, & Jones, 2008), and many of the specific phobias are associated with anxiety regarding situations that have the potential for harm or death (e.g., snakes, spiders, heights). This indicates that death anxiety has a pervasive impact across a range of anxiety disorders.

Death as a psychological threat: terror management theory

Terror management theory (TMT) is the leading and most influential theoretical approach to understanding the impact of death anxiety on human behaviour. According to TMT, the human motivation to stay alive, paired with the awareness that death can occur at any given moment, has the power to incite paralyzing fear of death (Greenberg et al., 1990; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). TMT argues that cultural worldviews and self-esteem serve an anxiety-buffering function in order to manage existential fear (Greenberg et al., 1992). Cultural worldviews (i.e., shared symbolic conceptions of reality) are thought to provide a sense of permanence and meaning, such as believing in life after death, or identifying with personal achievements. Likewise,

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self-esteem provides protection from death anxiety through the belief that one is meeting the standards of one's cultural worldview.

As an extension of TMT, the dual process model of death anxiety outlines how death-related thoughts are prevented from becoming death fears. According to this model, when death-related thoughts first enter conscious awareness, proximal defences are activated in order to remove death thoughts from focal attention. This is done by either suppressing death thoughts with distractions, or by denying vulnerability to death (Pyszczynski, Greenberg, & Solomon, 1999). When fear of death moves out of conscious awareness, the second part of the dual process model is activated, triggering distal defences (Greenberg et al., 1992). Distal defences include strategies to reduce the accessibility of death-related thoughts and death-related fears, such as investing in cultural worldviews, group identities, and close relationships that provide feelings of self-worth.

Death anxiety and anxious responding

From a TMT perspective, psychopathology reflects maladaptive efforts to cope with awareness of death, with these fears focused instead on more manageable threats (Maxfield, John, & Pyszczynski, 2014; Strachan et al., 2007). For instance, phobic responses to potentially threatening but typically harmless situations or objects (e.g., social encounters, enclosed spaces, snakes, spiders) may develop because anxiety focused on a concrete situation or object is considered more manageable than the thought of one's own death (Strachan et al., 2007). Anxiety Buffer Disruption Theory (Pyszczynski & Kesebir, 2011) also asserts that PTSD may be caused by disruption in an individual's anxiety-buffering mechanisms. This disruption results in the inability to defend against anxiety and death fears, and contributes to the onset and maintenance of PTSD symptomatology (Pyszczynski & Kesebir, 2011). Hence, individuals with PTSD may not respond to mortality salience (MS) in the same defensive ways as psychologically healthy individuals (Pyszczynski & Kesebir, 2011). This suggests that psychopathology may be associated with heightened anxiety and fear of death.

In line with this, Strachan et al. (2007) found that MS was associated with increased anxious responding to spider-related stimuli for spider phobic individuals, increased time spent hand washing for individuals with compulsive hand washing tendencies, and

increased social avoidance in socially anxious individuals. Furthermore, Routledge et al. (2010) found that MS increases social avoidance in individuals with low self-esteem. Together, these findings confirm that MS exacerbates anxious responding in socially anxious individuals.

Attentional bias in social anxiety

Despite the impact of MS on anxious responding, no studies have examined the impact of MS on attentional bias in social anxiety. Attentional biases are considered a core feature of social anxiety. In particular, Clark and Wells' (1995) model of social anxiety proposes that when a socially anxious individual fears negative evaluation from others, attention is shifted away from the environment towards internal cues (e.g., negative thoughts, physiological arousal). This bias in attention towards the self prevents the individual from accurately appraising audience feedback and may elicit negative reactions from others (Clark & Wells, 1995).

Similarly, Rapee and Heimberg's (1997) cognitive-behavioural model of social anxiety proposes that information-processing biases and distortions in socially evaluative situations produce and maintain social anxiety. According to this model, socially anxious individuals focus attention on both internal cues and external threats. That is, the socially anxious individual will scan the environment for information that confirms social fears, and will be vigilant in detecting these negative social cues. The individual will then attend to additional sources of information regarding the likelihood of feared outcomes occurring (e.g., a mental representation of the self as seen by the audience, and internal cues relating to the experience of anxiety).

These leading cognitive-behavioural models highlight the role that attentional processes play in social anxiety disorder. Accordingly, a large number of dot probe studies have been used to evaluate attentional biases in social anxiety. Dot probe studies, however, have low reliability and only provide a snapshot of attentional processing (Cisler & Koster, 2010). This has led researchers to utilise more advanced technologies, such as eye-tracking methodologies, to provide a continuous measure of overt visual attention (Garner, Mogg, & Bradley, 2006). Eye movement studies with high ecological validity (i.e., that contain anticipation of a feared outcome) have found consistent evidence for initial bias towards, and late-stage

avoidance of, social threat (i.e., angry and happy faces) (Chen & Guastella, 2014; Garner et al., 2006). This pattern of attentional bias is in line with the vigilant-avoidant hypothesis, which argues that socially anxious individuals are initially vigilant towards socially threatening stimuli, followed by strategic avoidance of social threat cues in order to reduce anxiety (Garner et al., 2006). For socially anxious individuals, both happy and angry faces can be perceived as threatening as both represent a form of evaluation by others (Weeks, Heimberg, & Rodebaugh, 2008).

The present study

MS has been found to exacerbate anxious responding in socially anxious individuals. In addition, MS has been found to influence attentional bias in certain individuals (Kelley, Tang, & Schmeichel, 2014). For instance, Kelley et al. (2014) found that MS was associated with biased attention towards positive vs. negative images for individuals higher in trait self-control, whereas individuals lower in trait self-control did not exhibit the same trend. To our knowledge, however, no studies have examined the impact of MS on attentional biases in social anxiety. When considering that social anxiety disorder is a prevalent, chronic, and debilitating condition (Ruscio et al., 2008; Slade et al., 2009; Stein & Kean, 2000), this is an important line of research. In particular, understanding the mechanisms that influence or exacerbate anxious responding facilitates a greater understanding of the relationship between MS and anxiety, and makes a valuable contribution to terror management research (Iverach et al., 2014).

Therefore, the purpose of the present study is to investigate the effect of MS (i.e., reminders of death) on attentional bias in social anxiety. The primary aim is to determine whether MS increases initial bias towards social threat (i.e., angry and happy faces), and late-stage avoidance away from threat (i.e., angry and happy faces), in socially anxious individuals. Based on previous findings, two hypotheses are proposed. First, it is hypothesised that socially anxious participants in the MS condition will demonstrate significantly more initial bias to social threat (i.e., angry and happy faces) than non-socially anxious participants in the MS condition and socially anxious participants in the control condition. Second, it is hypothesised that socially anxious participants in the MS condition will demonstrate significantly more avoidance of social threat (i.e., angry and happy

faces) than non-socially anxious participants in the MS condition and socially anxious participants in the control condition.

Method

Participants

Participants were first-year psychology students enrolled at Macquarie University. Eligibility criteria for inclusion in the study were: (1) 18 years of age and over, (2) self-reported high or low social anxiety, and (3) functional English. In order to confirm inclusion in the socially anxious or non-socially anxious group, participants completed a two-stage screening process, including the Brief Social Interaction Anxiety Scale/Social Phobia Scale (SIAS/SPS; Peters, Sunderland, Andrews, Rapee, & Mattick, 2012), followed by the SIAS (Mattick & Clarke, 1998). Inclusion in the socially anxious or non-socially anxious group required: (1) a score falling within the lower and upper quartile ranges of the SIAS/SPS, and (2) a score above 36 (i.e., socially anxious) or below 18 (i.e., non-socially anxious) on the SIAS.

One hundred and one first-year psychology students met initial screening criteria for inclusion in the study based on brief SIAS/SPS scores. However, 14 participants were removed from the socially anxious group, and 4 participants were removed from the non-socially anxious group, following the completion of the full SIAS. This resulted in a total of 83 participants, who were randomly allocated to one of the four conditions: (1) experimental (socially anxious); (2) experimental (non-socially anxious); (3) control (socially anxious); or (4) control (non-socially anxious).

Materials

Chosen materials and procedures were based on Strachan et al. (2007) experiment. Materials were presented in the following order:

Demographics Questionnaire. This questionnaire was used to obtain general information, including visual functioning. Two participants were removed due to the use of thick glasses.

SIAS (Mattick & Clarke, 1998). The SIAS is a 20-item, self-report measure designed to evaluate social anxiety and the tendency to fear social interactions in dyads or groups. A sample item is, "I become tense if I have to talk about myself or my feelings".

For the present study, mean SIAS scores were higher for socially anxious participants in the experimental and control conditions (experimental: mean = 46.72, SD = 7.52; control: mean = 44.89, SD = 2.80), than for non-socially anxious participants in the experimental and controls conditions (experimental: mean = 9.11, SD = 3.14; control: mean = 11.17, SD = 9.01).

Filler Questionnaire. This was completed prior to the experimental manipulation in order to make the experimental conditions appear less conspicuous. The questionnaire consists of two open-ended questions: "Describe a relationship between two people that you saw on TV", and "Jot down as specifically as you can what those two people were wearing".

Experimental (MS) induction. Participants in the experimental condition completed the MS induction in order to induce death-related thoughts. In order to conceal the true nature and purpose of the study, the induction was presented as a recently developed personality assessment ("Projective Life Attitudes Assessment") (Strachan et al., 2007). Participants were asked to: (1) "Please briefly describe the emotions that the thought of your own death arouses in you" and (2) "Jot down as specifically as you can what you think will happen to you as you physically die and once you are physically dead".

Control (intense physical pain) induction. Participants in the control condition completed the intense physical pain questionnaire. Participants were asked to: (1) "Please briefly describe the emotions that the thought of experiencing intense physical pain arouses in you" and (2) "Jot down as specifically as you can what you think will happen to you as you experience intense physical pain and once you have experienced intense physical pain". As in the experimental induction, this was also presented as a recently developed personality assessment.

Distraction/delay (word search) task. This involved a word search task. This task was completed following the experimental manipulation in order to allow death thoughts to pass from conscious to unconscious awareness, thus activating distal death defences (Pyszczynski et al., 1999).

Death thought accessibility (DTA) task (experimental manipulation check). In the DTA task, participants are asked to complete a total of 20 word fragments, including six words (e.g., "BURIED", "DEAD", etc.) that can either be completed with a death-themed or neutral word.

Nimstim set of facial expressions (Tottenham et al., 2009). The Nimstim set of facial expressions was

used in the eye-tracking procedure. For the practice stimuli, 16 monochrome photographs of 8 happy and 8 angry Caucasian faces (4 female and 4 male) were matched with a neutral face of the same person. For the experimental stimuli, 32 monochrome photographs of 16 happy and 16 angry Caucasian faces (8 female and 8 male) were matched with a neutral face of the same person.

Apparatus. Eye movements recorded via the Tobii T120 eye-tracking system (Tobii Technology, 2008).

Procedure

Participants were randomly assigned to either the experimental (MS) or control (intense physical pain) condition. Participants then completed paper-and-pencil, self-report measures in a private research room on campus, with the researcher present in the room. Calibration to the eye-tracker involved viewing a series of dots for less than 1 min, followed by a practice trial, which involved viewing a series of 16 angry-neutral and happy-neutral Nimstim practice face pairs. The experimental procedure then commenced, with the participant viewing 32 angry-neutral and happy-neutral face pairs. That is, each angry or happy face was paired with a neutral face. All face pairs were counterbalanced and presented in a random order. Upon completion of all tasks, participants were debriefed regarding the true nature of the study and given course credit for their time.

Preparation of eye movement data

Eye fixations were considered valid and included in the analyses if: (1) the participant's eyes were fixated on the probe before the stimulus image onset, (2) fixations fell within the facial area of the stimulus images, (3) eye movements occurred at least 100 ms after the picture onset, and (4) eye movements did not occur either directly before and/or directly after blinking (Gamble & Rapee, 2010). These criteria resulted in the exclusion of 3.89% of eye movement data. Initial bias was defined as the number of fixations directed to the emotional face (i.e., angry or happy), as a proportion of total fixations for that particular face pair type, during the first 500 ms of the 3000 ms viewing exposure (Gamble & Rapee, 2010; Garner et al., 2006). Scores greater than 0.5 indicate vigilance for social threat, and scores less than 0.5 indicate avoidance of social threat. The 3-s stimulus exposure time was divided into 1-s intervals, and the proportion of

fixations to the emotional face was computed for each face type and time interval (Gamble & Rapee, 2010).

Data analysis

A full factorial repeated measures mixed model analysis of variance was conducted in order to test *Hypothesis 1*. Bias scores for the first 500 ms of the 3000 ms exposure time were entered into the model with face valence (angry–neutral, happy–neutral) as a within-subjects variable, and social anxiety (high vs. low) and experimental/control condition (MS vs. physical pain) as between-subjects variables.

A full factorial repeated measures mixed model analysis of variance was conducted to test *Hypothesis 2*. Bias scores for the entire exposure time (0–3000 ms) were entered into the model with face valence (happy and angry) and time (0–1000 ms, 1000–2000 ms, 2000–3000 ms) as within-subjects variables, and social anxiety (high vs. low) and experimental/control condition (MS vs. physical pain) as between-subjects variables.

All analyses assumed a .05 level of statistical significance without adjustment for multiple comparisons. Descriptive statistics and effect sizes were also used to make informative judgements regarding differences between conditions. The decision not to adjust for multiple comparisons was made in order to reduce the chance of reporting scientifically important findings as non-significant. This approach has been endorsed by the American Psychiatric Association (2013). With 73 participants in total, there was more than 80% power to detect a large effect (.8 based on Cohen's measure), assuming a 5% level of significance.

Results

Participants

Of the 83 participants who met criteria for inclusion in the present study, 10 participants were excluded because eye movements were recorded on less than 85% of eye-tracking trials. This resulted in a final sample of 73 participants, including 17 socially anxious and 19 non-socially anxious in the experimental condition, and 19 socially anxious and 18 non-socially anxious in the control condition. Of the 73 participants included in the present study, 60 were female and 13 were male. Participants ranged in age from 18 to 50 years ($M = 19.97$, $SD = 5.789$).

Manipulation check

An independent samples *t*-test revealed that participants in the experimental condition subsequently identified significantly more death-related words on the DTA task ($M = 2.42$, $SD = 0.77$) than participants in the control condition ($M = 1.84$, $SD = 1.12$), $t(71) = 2.57$, $p = .012$, $d = .60$, 95% CI [0.13, 1.03].

Attentional bias

Table 1 shows the scores for initial bias (0–500 ms) and late-stage avoidance (0–3000 ms) for socially anxious and non-socially anxious participants in the experimental and control conditions.

Initial bias to social threat (Hypothesis 1). A full factorial three-way $2 \times 2 \times (2)$ mixed analysis of variance revealed a significant interaction between social anxiety group and experimental condition for initial bias towards social threat (angry or happy faces), $F(1,69) = 4.332$, $p = .041$, $\eta_p^2 = .059$. As shown in Figure 1, pairwise comparisons revealed that this effect for initial bias towards angry and happy faces was significant when comparing socially anxious and non-socially anxious participants in the experimental condition (socially anxious: $M = 0.58$, $SD = 0.08$; non-socially anxious: $M = 0.53$, $SD = 0.07$), $F(1,69) = 6.358$, $p = .014$, $\eta_p^2 = .084$, 95% CI [0.010, 0.084], and when comparing socially anxious participants in the experimental and control conditions (control: $M = 0.54$, $SD = 0.08$), $F(1,69) = 5.404$, $p = .023$, $\eta_p^2 = .073$, 95% CI [0.006, 0.081]. That is, when participants were presented with happy–neutral and angry–neutral face pairs, socially anxious participants in the experimental condition demonstrated significantly more bias towards social threat (angry or happy faces) than non-socially anxious participants in the experimental condition and socially anxious participants in the control condition, with moderate effect sizes.

Late-stage avoidance of social threat (Hypothesis 2). A full factorial four-way $2 \times 2 \times (2 \times 3)$ mixed analysis of variance revealed no significant interaction between social anxiety group and experimental condition for late-stage avoidance of social threat $F(1,69) = 0.698$, $p = .406$, $\eta_p^2 = .010$.

Death thought accessibility

The DTA scale was originally utilised as a manipulation check to confirm the identification of significantly

Table 1. Scores for initial bias (0–500 ms) and late-stage avoidance (0–3000 ms) for socially anxious and non-socially anxious individuals in the experimental and control conditions

Time interval (ms)	Face valence	Experimental (MS)				Control (physical pain)			
		High SA		Low SA		High SA		Low SA	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
0–500	Angry	0.6	0.07	0.54	0.06	0.54	0.09	0.55	0.07
0–500	Happy	0.57	0.06	0.53	0.08	0.53	0.07	0.54	0.09
0–1000	Angry	0.62	0.05	0.57	0.03	0.57	0.05	0.56	0.04
0–1000	Happy	0.56	0.07	0.56	0.06	0.57	0.07	0.56	0.06
1000–2000	Angry	0.62	0.1	0.55	0.07	0.58	0.11	0.58	0.09
1000–2000	Happy	0.6	0.1	0.6	0.05	0.61	0.09	0.59	0.07
2000–3000	Angry	0.52	0.06	0.51	0.07	0.53	0.06	0.52	0.06
2000–3000	Happy	0.51	0.06	0.52	0.05	0.52	0.06	0.51	0.04

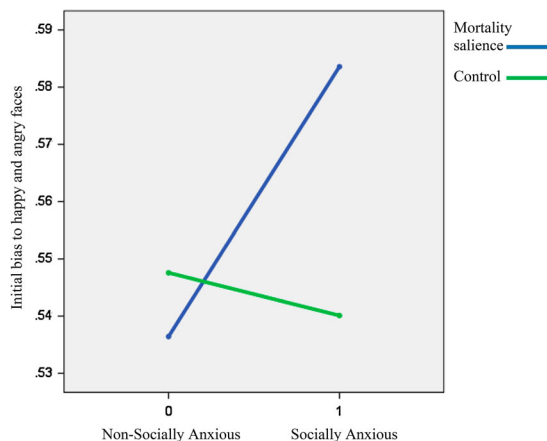
Note: SA = social anxiety; bias scores represent the proportion of total fixations for that face pair type, with scores greater than 0.5 indicating vigilance for social threat, and scores less than 0.5 indicating avoidance of social threat; each angry or happy face was always paired with a neutral face.

more death-related words by participants in the experimental vs. control condition (see above). However, additional analyses were conducted to determine whether DTA mediated any of the results found in the present study. In linear regression analysis there was no evidence of an interaction between treatment group and social anxiety status for prediction of DTA as an outcome ($p = .10$). There was also no evidence of an association between DTA and social anxiety status ($p = .91$), but there was strong evidence of an association between DTA and experimental/control condition ($p = .009$) consistent with the results reported above. There was no suggestion that DTA mediated the interaction effect of experimental/control condition and social anxiety status on initial eye-tracking bias. After adjustment for DTA, all three significant effects reported above remained

($p < .05$). Furthermore, there was no association between DTA and initial eye-tracking bias ($p = .72$).

Discussion

To our knowledge, this is the first study to examine the impact of MS on attentional bias in social anxiety using eye-tracking technology. It is also one of very few studies in the TMT literature to focus on socially anxious vs. non-socially anxious individuals. This is a considerable advance upon past research, and widens the territory of research investigating the relationship between MS and psychopathology, thus corresponding with recent calls for more research in this area (Furer, Walker, & Stein, 2007; Greenberg, 2012; Iverach et al., 2014). By understanding the mechanisms underlying anxious responding and MS, a

**Figure 1.** Interaction between initial bias scores for socially anxious and non-socially anxious participants in the experimental and control conditions ($p = .041$).

deeper understanding of the role that death anxiety may play in psychopathology is revealed, thereby identifying possible treatment targets for socially anxious individuals who also report death anxiety.

The primary aim of this study was to evaluate initial bias towards social threat, and late-stage avoidance away from social threat, for socially anxious and non-socially anxious participants exposed to either a MS or control condition. Findings from this study confirm that MS is capable of exacerbating anxious responding in socially anxious individuals, with significant effects found for initial bias to social threat. This confirms previous evidence regarding the impact of MS on anxious responding in socially anxious individuals (Routledge et al., 2010; Strachan et al., 2007), and corresponds with recent evidence that MS is associated with biased attention towards positive vs. negative images among individuals higher in trait self-control (Kelley et al., 2014). Hence, the present findings are aligned with a wider body of research regarding the role of death anxiety across a range of psychological conditions (Iverach et al., 2014).

As predicted, socially anxious participants in the experimental condition demonstrated significantly more initial bias to social threat, when compared with non-socially anxious participants in the experimental condition and socially anxious participants in the control condition. This corresponds with the first stage of the vigilant-avoidant hypothesis, which argues that socially anxious individuals are vigilant in detecting socially threatening stimuli (Garner et al., 2006). In particular, socially anxious participants in the MS condition were vigilant in detecting both angry and happy faces. This corresponds with the theoretical perspective that social anxiety is associated with fear of both negative and positive social evaluation (Garner et al., 2006).

Furthermore, similar findings have been reported in previous studies investigating attentional bias in socially anxious individuals following priming with the anticipation of a stressful situation (i.e., ecologically valid designs). For instance, when primed with the anticipation of presenting a speech, socially anxious individuals have been found to display increased vigilance to social threat (i.e., angry and happy faces), when compared to socially anxious individuals not primed with a feared situation (Chen & Guastella, 2014; Garner et al., 2006). This suggests that, for socially anxious individuals in the present study, thinking about death may trigger distal defences to increase vigilance to social threat (i.e.,

either angry or happy faces) in order to reduce death anxiety.

This finding of vigilance to both happy and angry faces corresponds with growing evidence that social anxiety is characterised by fear of evaluation in general, including fear of both negative and positive social evaluation (Heimberg, Brozovich, & Rapee, 2010; Weeks et al., 2008). That is, socially anxious individuals may actually perceive positive social evaluation (e.g., happy faces) as threatening because it generates apprehension about increased social demands, anticipated social failures, and possible negative evaluation (Alden, Taylor, Mellings, & Laposa, 2008; Heimberg et al., 2010; Weeks et al., 2008). A growing body of research using eye-tracking technology has found evidence that socially anxious individuals are vigilant to angry and happy faces, with vigilance to happy faces typically occurring within 500 ms or less of the image onset (Chen, Clarke, MacLeod, & Guastella, 2012; Chen & Guastella, 2014; Garner et al., 2006). Hence, findings from the present study correspond with this previous evidence, and indicate that socially anxious participants in the MS condition perceived both angry and happy faces as threatening.

Finally, no significant differences in late-stage avoidance of social threat were found for socially anxious participants in the experimental condition, when compared to non-socially anxious participants in the experimental condition and socially anxious participants in the control condition. This suggests that MS had a unique effect upon initial bias to social threat for socially anxious individuals, but did not impact late-stage avoidance of social threat. This finding may be explained by the fact that eye-tracking technology only captures overt visual attention (Posner, Snyder, & Davidson, 1980). Although research has indicated that these movements are closely aligned with the attentional system, it is possible that attention may shift without eye movement (i.e., covert attention). In particular, covert attention is thought to precede shifts in overt attention (Posner et al., 1980). As the present study does not provide a comprehensive analysis of attentional processes, this may partly explain the non-significant effect for late-stage avoidance. That is, following initial bias, socially anxious participants may have covertly moved their attention away from social threat. Additional research is required to understand overt and covert attentional shifts in socially anxious individuals following MS induction.

Considerations

Findings from the present study elucidate the impact of MS on attentional processes in social anxiety. Despite the significance of these results, a number of considerations must be highlighted. First, the present study comprised socially anxious or non-socially anxious participants based on self-report. It is possible that a clinical sample of patients diagnosed with social anxiety disorder may have demonstrated a different pattern of results. However, all participants completed a two-stage screening process to confirm inclusion in the socially anxious or non-socially anxious group. As such, the present study may provide a platform for investigating the impact of MS on patients diagnosed with social anxiety disorder.

Second, participants in the present study included first-year psychology students, with a mean age of 19 years, most of whom were female (82.2%). A recent meta-analysis found that gender has the capacity to moderate MS effects (Burke, Martens, & Faucher, 2010). That is, females may have the propensity to fear death more than males (Russac, Gatliff, Reece, & Spottswood, 2007), and this may have had some bearing on the results of the present study. Added to this, research has shown that death anxiety may change over the lifespan (Russac et al., 2007), with findings from the present study providing only a snapshot of MS effects in younger adults. Although these findings cannot be generalised to the wider community, they correspond with a vast array of MS experiments which have used first-year psychology students to investigate MS effects (Burke et al., 2010).

Implications and future directions

Results from this study improve our understanding of the role that death anxiety may play in psychological functioning. That is, death anxiety may have a unique influence on anxious responding for socially anxious individuals, with evidence of increased social avoidance (Strachan et al., 2007) and attentional bias towards social threat following exposure to MS. These findings correspond with the evidence that death anxiety may be a transdiagnostic construct underlying a range of psychological conditions, such as illness anxiety disorder, panic disorder, PTSD, and obsessive compulsive disorder (Iverach et al., 2014). Taken together, the present findings suggest that socially anxious individuals may be more prone to

experience death anxiety, and that MS may in turn exacerbate anxious responding.

In line with this, additional clinical support and management may be required for individuals who report an underlying fear of death. Numerous approaches to the treatment of death anxiety have been suggested, with the treatment of death anxiety found to improve presenting conditions. For example, existential psychotherapy and cognitive behaviour therapy have been used to treat a range of psychological disorders and conditions related to a fear of death (Vos, Craig, & Cooper, 2015), including use of exposure, systematic desensitisation, and cognitive reappraisal of death anxiety (Furer & Walker, 2008). These approaches hold promise as transdiagnostic treatments for death anxiety, and suggest the need for controlled studies to investigate the efficacy of these approaches in treating death anxiety (Iverach et al., 2014).

Conclusion

The purpose of the present study was to examine the impact of MS on attentional bias in social anxiety. MS was found to increase initial bias to social threat for socially anxious individuals. This corresponds with growing evidence that death anxiety has the potential to elicit anxious responding in individuals with social anxiety, compulsive tendencies, and phobias (Menzies, Menzies, & Iverach, 2015; Strachan et al., 2007). As such, it is important to determine whether MS effects occur across other mental disorders, and whether the co-occurrence of death anxiety alongside these disorders has implications for treatment success and/or resistance. Overall, the present study provides the platform for additional research and confirms the potential for death anxiety to significantly impact everyday life functioning.

Disclosure statement

No potential conflict of interest was reported by the authors.

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