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Single versus Multi-Sentence Paradigm as a Method of Stress Induction

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Abstract

The current study investigated the effects of a single- vs. multi-sentence stress induction paradigm on subjective ratings of discomfort, anxiety, and distress in a non-clinical sample. The Single-Sentence task required participants to write a sentence stating the hope that a loved one is involved in a car accident. The Multi-Sentence task required participants to write five sentences that added greater detail to the hypothetical accident. As predicted, both tasks were associated with an increase in the three dependent variables, suggesting that both served as stress induction procedures. Contrary to predictions, however, the Multi-Sentence Condition did not induce greater stress than the Single-Sentence Condition, although the former was associated with greater willingness to engage with thoughts of the accident and greater vividness of thoughts. In contrast, the Single-Sentence Condition was associated with stronger feelings of guilt and moral wrongness. The implications of the findings for existing stress induction procedures are discussed.
Key words: stress induction, anxiety, believability.

Clinical researchers have generated an array of experimental contexts for the investigation of various aspects of mental distress, in the hope of improving our understanding and treatment of mental health issues (e.g., Hayes, Bisset, Korn, *et al*., 1999; Wegner, Schneider, Carter, & White, 1987). Existing methods of experimental stress induction employed as analogs of clinically relevant processes include: the CO_2 challenge (e.g., Levitt, Brown, Orsillo, & Barlow, 2004); the cold-pressor task (e.g., Keogh, Bond, Hanmer, & Tilston, 2005); brief electric shock (e.g., McMullen, Barnes-Holmes, Barnes-Holmes, Stewart, Luciano, & Cochrane, 2008); and radiant heat induction (e.g., Kehoe, Barnes-Holmes, Barnes-Holmes, Cochrane, & Stewart, 2007). These procedures have been used to investigate psychological processes, such as thought suppression, panic, and pain tolerance, as well as treatment susceptibility, including the use of acceptance-based protocols.

Although numerous studies of experimental stress induction have involved specific clinical samples, such as persons with obsessive compulsive disorder (OCD; e.g., Purdon, Rowa, & Antony, 2005), an even greater number have investigated non-clinical populations (e.g., Mancini, D'Olimpio, & Cieri, 2004). For example, non-clinical samples have been

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used to study aspects of OCD, such as intrusive thoughts and compulsive behaviors (e.g., Muris, Meesters, Rassin, Merckelbach, & Campbell, 2001). Indeed, findings have highlighted the overlap of these processes between clinical and non-clinical populations. For example, Rachman and de Silva (1978) demonstrated that the content of intrusive thoughts in non-clinically anxious individuals is indistinguishable from that experienced by persons with OCD. Overall, Gibbs (1996) proposed that the volume of non-clinical samples in anxiety research, in particular, had contributed directly to the expansion of knowledge in that area.

One of the shortest forms of stress induction was employed by Rachman, Shafran, Mitchell, Trant, and Teachman (1996) in an attempt to analog the process of thought-action fusion (TAF), believed to be central to OCD. Specifically, participants were asked to insert the name of a close relative or friend into the sentence "I hope [name] is in a car accident" and then say the sentence aloud, while trying to visualise the hypothetical scene. The findings indicated that the experimental manipulation increased anxiety, guilt, and feelings of moral wrongness, as measured on visual analog scales (VASs), which the researchers interpreted as key features of TAF.

Numerous studies have replicated these effects with non-clinical samples and highlighted the utility of the single sentence stress induction procedure in the study of anxiety processes. For example, both van den Hout, Kindt, Weiland, and Peters (2002), and Bocci and Gordon (2007) employed the procedure to investigate the effects of neutralizing behavior. In addition, Marcks and Woods (2007) used it to explore the relationship between TAF beliefs and thought suppression, while Zucker, Craske, Barrios, and Holgiun (2002) investigated the utility of educational interventions in offsetting anxiety. Overall, the data from these studies bears strong similarity to Rachman *et al*.'s (1996) original findings in demonstrating that the single sentence stress induction procedure successfully elevates subjective ratings of anxiety, guilt, and moral wrongness in non-clinical samples.

The robust nature of these outcomes is perhaps remarkable given the brevity and simplicity of Rachman *et al*.'s (1996) experimental manipulation (i.e., a single sentence). The current research attempted to explore this issue by examining the potential impact of adding more sentences on the stress induction effects. Consistent with this simple aim, the current hypothesis predicted that a Multi-Sentence Condition would be associated with larger increases in measures of stress induction than a Single-Sentence Condition that resembled the original manipulation. This hypothesis was based on the fact that a longer manipulation would generate more vividness of the scene and thus increase participants' negative appraisal of the hypothetical accident. Bearing in mind the significance of the single sentence paradigm in OCD research, this experiment did not attempt to replicate any previous investigation of TAF. The task was implemented as a stress induction procedure outside and separate from the arena of thought-action fusion, with the simple aim of investigating its utility in inducing subjective anxiety, discomfort or distress in a non-clinical sample.

Method

Participants

Ninety volunteers (43 male and 47 female) participated in the current experiment. All were aged between 18 and 23, were undergraduates from the National University of Ireland Maynooth (NUIM), and were able to drive. A number of exclusion criteria resulted in 26 participants not completing the experiment. Any individuals who reported that they had recently lost a loved one in an accident were excluded from participation because the experiment involved asking participants to imagine such an event. In addition, individuals who reported significant mental health issues (e.g., anxiety) that might be adversely affected by participation were also excluded. This yielded a final sample of 64 participants (29 male and 35 female, *Mean age*= 19.96 years) assigned randomly across two experimental conditions -Single-Sentence and Multi-Sentence.

Measures

The study involved an Experimental Screening Questionnaire (ESQ) and two self-report measures -the Acceptance and Action Questionnaire-II (AAQ) and the Philadelphia Mindfulness Scale (PHLMS). These measures were designed to assess participants' pre-experimental levels of acceptance and mindfulness in order to ensure balance across the two conditions. Because the experimental manipulation involved asking participants to imagine a loved one in a road traffic accident, the ESQ was designed to ascertain if such events had previously impacted upon potential participants (and to exclude those for whom this was the case).

The AAQ is a standard measure of experiential avoidance (Bond *et al*., 2011). Scores on the seven items (e.g., "I'm afraid of my feelings") are summed to generate a total for avoidance (maximum= 49, minimum= 7). The mean for a non-clinical sample has been reported at 17.34 (*SD*= 4.37), with a mean alpha coefficient of .84 (.78 -.88), and 12-month test-retest reliability of .79 (Bond *et al*., 2011).

The PHLMS is a standard measure of mindfulness capabilities (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). This 20-item measure contained 10 items that assessed mindful awareness (e.g., "I am aware of what thoughts are passing through my mind") and 10 that assessed mindful acceptance (e.g., "There are aspects of myself I don't want to think about"). Total scores (across both sub-scales) range from 20 to 100. The mean for a non-clinical sample has been reported at 36.65 (*SD*= 4.93) and 30.19 (SD= 5.84) on the awareness and acceptance scale, respectively. Internal consistency reliability analyses have yielded a Cronbach's alpha level of 0.75 for awareness and 0.82 for acceptance (Cardaciotto *et al*., 2008).

Visual Analog Scale (VAS) ratings of discomfort, anxiety, and distress. Three dependent measures assessed participants' current self-reported levels of discomfort, anxiety, and distress before and after the experimental manipulation. Each measure comprised of a VAS, on which participants placed an X from 0% (e.g., No Discomfort) to 100% (e.g., Very Much Discomfort).

Reactions Questionnaire. After the experimental manipulation, participants were presented with a short questionnaire to assess their reactions to writing and speaking about the hypothetical accident. The questionnaire consisted of five questions, each referring to willingness, vividness, believability, moral wrongness, or guilt (e.g., "Please rate how much guilt you feel after saying and writing the sentence"). Participants also responded to these questions by placing an X on a corresponding VAS (e.g., No Guilt) to 100% (e.g., Very Much Guilt).

Procedure

The current study comprised of four stages (Stages 1-4), always conducted in the same order.

Stage 1: Screening measures. Prior to commencement, participants completed the ESQ, PHLMS, and AAQ. During a short break, these measures were assessed for exclusion purposes. Where exclusion applied, participants were thanked and debriefed. All others proceeded immediately to the next stage.

Stage 2: Baseline VAS ratings. During Stage 2, participants completed the three baseline VAS ratings of discomfort, anxiety, and distress.

Stage 3: Experimental manipulation (Single-Sentence vs. Multi-Sentence Conditions). The experimental manipulation that comprised the Single-Sentence Condition was taken from previous research by Rachman *et al*. (1996). The Multi-Sentence task was developed for current purposes. Prior to each manipulation, all participants were asked to write down "the name of the person you care about most in the world."

Single-Sentence Condition. The Single-Sentence Condition primarily involved participants saying aloud and writing a potentially upsetting *sentence* about the involvement of a loved one in an accident. The instructions were as follows:

> Ok, so when you're ready we will begin. What is going to happen is that I am going to call out a sentence that I want you to repeat word for word. Once I read out the sentence, if you can, I want you to take a moment to imagine the scene it describes and then say the sentence with as much meaning as you can. Once you have said the sentence aloud, I want you to then write it down on the page in front of you. Now remember, if you don't want to say the sentence or you want to stop writing it at any stage, you are completely free to do so. Just let me know and we will stop what we are doing and move onto the next part of the experiment. Is that ok with you? Do you have any questions at this point? (Participant affirms). Ok let's begin. Here is the sentence: "I hope (name of loved one) dies in a car accident."

Multi-Sentence Condition. The difference between the two conditions centered on the use of a more extended hypothetical accident story in the Multi-Sentence Condition. Specifically, participants were asked to repeat and write *five* sentences regarding the accident in an attempt to increase the vividness and impact of the exercise. In order for this to be realistic, participants in this condition were asked additional questions about the loved one (e.g., what is she/he doing today, what time would she/he be finished, etc.). This ensured the scenario was relevant and unique to each individual. Participants in the Multi-Sentence Condition were instructed as follows:

Ok, so when you're ready we will begin. What is going to happen is that I am going to call out five sentences and stop after each one. Once I read out the sentence, if you can, I want you to take a moment to imagine the scene it describes and then say the sentence with as much meaning as you can. Once you have said the sentence aloud, I want you to write it down on the page in front of you. When this is done, we will move onto the next sentence. So, I will say the sentence, you repeat it and you write it down. Now remember, if you don't want to say any of the sentences or if you want to stop writing at any stage, you are completely free to do so. Just let me know and we will stop what we are doing and move onto the next part of the experiment. Is that ok with you? Do you have any questions at this point? (Participant affirms). Ok let's begin. Here is the first sentence:

"Today at X o'clock (name of loved one) is waiting for me to collect him/her (*participant repeats and writes*).

She/he does not know that I am feeling very sleepy at the wheel of my car (*participant repeats and writes*).

Just as I pull up, my eyes close and I lose control of the car (*participant repeats and writes*).

My car speeds onto (name of loved one's) side of the road and I hit him/her head on (*participant repeats and writes*).

I hope (name of loved one) dies in the car accident (*participant repeats and writes*)."

Stage 4: Post-manipulation VAS ratings and Reactions Questionnaire. The post-manipulation VAS ratings were identical to Stage 2. In addition, Stage 4 involved presentation of the Reactions Questionnaire to assess participants' reactions to saying and writing the sentence(s) about the hypothetical accident.

RESULTS

Three main investigations were central to the current research. The first examined the effect of the experimental manipulation (Single- or Multi-Sentence) on mean scores of discomfort, anxiety, and distress. The second determined whether the Multi-Sentence Condition would be associated with greater increases in participants' discomfort, anxiety, and distress relative to the Single-Sentence Condition. The final investigation explored potential differences between the conditions in terms of participants' reactions to the imaginary scenario.

Participants in the two conditions did not differ significantly on the preexperimental measures of acceptance or mindfulness. Specifically, the mean and standard deviations for the AAQ for the Single-Sentence Condition was 16 (*SD*= 5.1) and 18 (*SD*= 6.2) for Multi-Sentence. The mean PHLMS score for the acceptance subscale was 29 (*SD*= 4.6) for the Single-Sentence Condition and 28 (*SD*= 8) for the Multi-Sentence. The mean for the awareness subscale was 33 (*SD*= 5.5) for the Single-Sentence and 34 (*SD*= 7.4) for the Multi-Sentence. Two independent samples t-tests confirmed that the conditions did not differ significantly on either measure (all p's >.11).

Both the Single- and Multi-Sentence Conditions increased participants' self-reported levels of discomfort, anxiety, and distress. The mean VAS ratings for pre- and post-manipulation by condition in each of these dependent variables are presented in Figures 1, 2, and 3.

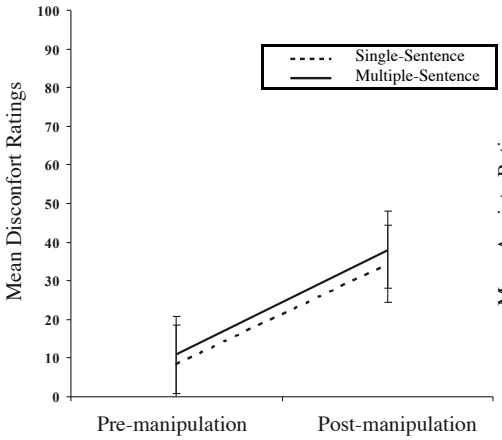

Figure 1. Mean VAS Discomfort Ratings per Condition at Pre- and Post-Manipulation.

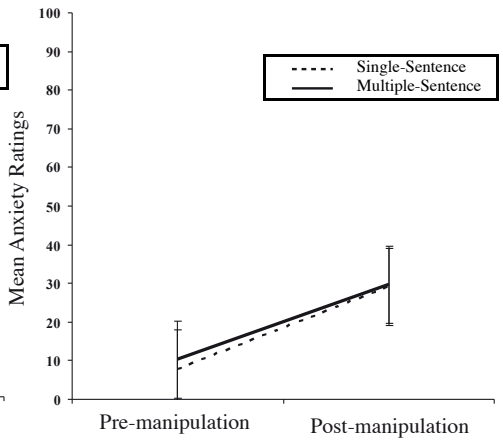

Figure 2. Mean VAS Anxiety Ratings per Condition at Pre- and Post-Manipulation.

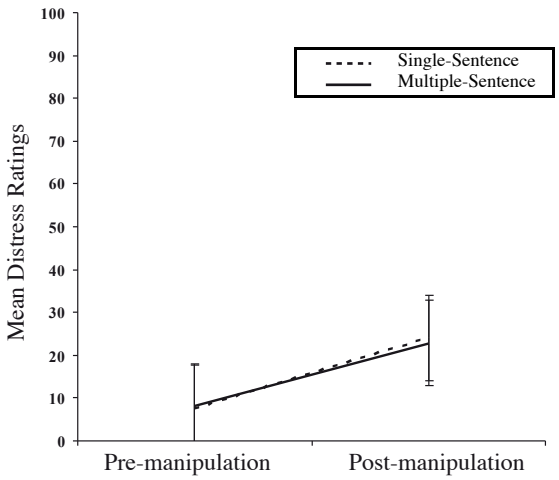

Figure 3. Mean VAS Distress Ratings per Condition at Pre- and Post-Manipulation.

The VAS ratings of discomfort at baseline were extremely low (i.e., all participants scored <11/100). This pattern changed for both conditions at post-manipulation (see Figure 1). A Mixed Between Within 2x2 Analysis of Variance (ANOVA) revealed a highly significant main effect for time (Wilk's *Lambda*= .45, $F(1, 62)= 74.6$, $p <.0001$, partial *eta* squared= .546), but not for condition ($F(1, 62)= .727$, p= .397, partial *eta* squared= .012). The interaction effect was also non-significant (Wilk's *Lambda*= 1.0, $F(1, 62)= .04$, $p= .84$, partial *eta* squared= .001).

The VAS ratings of anxiety were also extremely low at baseline (i.e., all <11/100). Anxiety increased similarly after both manipulations (see Figure 2). A 2x2 ANOVA

again revealed a highly significant main effect for time (Wilk's *Lambda*= .58, *F*(1, 62)= 44.14, *p* <.0001, partial *eta* squared= .42), but not for condition (*F*(1, 62)= .173, *p*= .679, partial *eta* squared= .003), or the interaction effect (Wilk's *Lambda*= 1.0, *F*(1, 62)= .083, *p*= .774, partial *eta* squared= .001).

The VAS ratings of distress were again extremely low at baseline (i.e., all <9/100) and increased similarly after both manipulations (see Figure 3). A 2x2 ANOVA revealed a highly significant main effect for time (Wilk's *Lambda*= .65, *F*(1, 62)= 33.4, *p* <.0001, partial *eta* squared= .35), but not for condition (*F*(1, 62)= .012, *p*= 9.15, partial *eta* squared= .000) or the interaction effect (Wilk's *Lambda*= 1.00, *F*(1, 62)= .1, *p*= .75, partial *eta* squared= .002).

Participant ratings of their willingness to engage with thoughts about the imaginary accident were low to moderate (see Table 1). In particular, the ratings on Multi-Sentence were almost twice as high as Single-Sentence (54 vs. 27). An independent samples *t*-test indicated that this difference was highly significant [*t* (32)= -2.967, *p*= .006].

Ratings of the vividness of thoughts and images of the accident were also low to moderate (see Table 1). Again, Multi-Sentence ratings were much higher than Single-Sentence (52 vs. 30). An independent samples t-test indicated that this difference was also highly significant [*t* (62)= -3.234, *p*= .002].

Believability ratings of the accident were moderate for both conditions (see Table 1), but marginally higher for Multi-Sentence (36 compared with 25). An independent samples *t*-test indicated that this difference approached significance [*t* (62)= -1.726, *p*= .089].

Ratings of guilt generated by writing and saying the sentence(s) about the imaginary accident were moderate (see Table 1), although Multi-Sentence was lower (41 vs. 51). An independent samples *t*-test indicated that this difference was not significant [*t* (62)= 1.213, *p*= .230].

Ratings of how morally wrong it felt to write and say the sentence(s) were moderate (see Table 1), with Multi-Sentence lower (48 compared with 60). An independent samples t-test indicated that this difference was not significant [*t* (61)= 1.325, *p*= .190].

Table 1. Means, Standard Deviations, and Significance Values by Condition on Each of the Five Reactions Questions.

Reactions Questionnaire	Single-Sentence *M/100* (*SD*)	Multi-Sentence *M/100* (*SD*)	*p* values
Please rate your level of willingness to engage with your thoughts of the accident.	27.06 (26.00)	53.79 (26.53)	.006
Please rate how vivid your thoughts and images were of the car accident.	30.16 (28.35)	52.19 (26.09)	.002
Please rate how believable the accident scenario was to you.	25.03 (25.40)	36.37 (27.15)	.089
Please rate how much guilt you feel after saying and writing the sentence (s).	51.45 (33.19)	41.45 (32.73)	.230
Please rate how morally wrong you felt it was to write or say the sentence (s).	59.59 (35.33)	48.03 (33.9)	.190

Notes: *M*= average; *SD*= Standard Deviation; *p* values: Statistical significance.

A series of bi-variate correlations were conducted using the Pearson product-moment correlation coefficient. Overall, comparisons between the screening measures and the dependent variables at baseline yielded mostly weak and non-significant results, with two exceptions. First, there was a significant positive correlation between the AAQ and distress [r= .285, p <.05]. Although non-significant, there was also a small positive correlation between the AAQ and both discomfort [r= .065, p= .61] and anxiety [r= .055, p= .67]. In short, more avoidance was associated with more distress, discomfort, and anxiety. Second, there was a significant positive correlation between the awareness scale of the PHLMS and distress [r= .276, p <.05]. This indicated that more awareness was moderately associated with more distress. Although non-significant, there was also a small negative correlation between awareness and both discomfort [r= -.102, p= .422] and anxiety [r= -.020, p= .877]. This indicated that more awareness was weakly associated with less discomfort, and anxiety. Again although non-significant, there was a weak positive correlation between the acceptance scale of the PHLMS and all three dependent variables (discomfort [r= .175, p= .166], anxiety [r= .027, p= .834], and distress [r= .226, p= .072]). That is, more acceptance was weakly associated with more discomfort, anxiety, and distress.

The data from the screening measures indicated that participants did not differ preexperimentally on their propensities towards acceptance or mindfulness. At baseline, all were very low in discomfort, anxiety, and distress, but both conditions showed significant increases on all three ratings at post-manipulation. However, the research prediction that the Multi-Sentence Condition would be asscociated with greater increases in the dependent variables was not confirmed. Nonetheless, results from the Reactions Questionnaire indicated some differences between conditions. Specifically, Multi-Sentence participants were significantly more willing to engage with their thoughts about the accident and had significantly more vivid thoughts than those in the Single-Sentence Condition. The former participants also reported higher thought believability, with a difference approaching significance. Levels of participant guilt or feelings of moral wrongness did not differ significantly across conditions, although participants in the Single-Sentence Condition were higher on each. Correlation analyses between the screening measures and dependent variables at baseline yielded some significant and interesting results. Specially, more avoidance was associated with more distress, discomfort, and anxiety. More awareness was associated with less discomfort and anxiety. And, more acceptance was associated with more distress, discomfort, and anxiety.

DISCUSSION

The existing literature contains a range of experimental stress induction procedures that differ primarily in terms of the stimuli or situations used to evoke affect and/or the types of responses measured (e.g., physiological, subjective, etc.). These differences make comparisons of the relative utility of procedures difficult. However, the current findings bear some similarity with existing evidence in terms of both the single-sentence

stress induction paradigm and in terms of more-established procedures such as the CO_2 challenge and radiant heat induction.

The literature contains only a small number of studies that have investigated the stress induction potential of the single-sentence procedure. The current work sought to extend research by Rachman *et al*. (1996) who were the first to publish on the use of this methodology and its impact on subjective anxiety. Those results indicated that anxiety increased by 53 VAS points, a much larger increase than that recorded here (i.e., a mean increase of 21 points across both conditions). A critical difference, however, across the two studies concerns the use of a self-selected sample high in TAF in the original work, compared with a random sample of undergraduates presently. In contrast, the current anxiety outcomes are more in keeping with the findings reported by van den Hout *et al*. (2002) and by Zucker *et al*. (2002), whose mean increases in anxiety (for the control groups) was approx. 29 and 27 VAS points, respectively. In addition, the present results are in line with the increase in subjective anxiety reported by Bocci and Gordon (2007), which was approx. 36 VAS points.

The current increase in anxiety is also in line with findings reported by Levitt *et al*. (2004), who measured subjective anxiety in a clinical sample of persons with panic disorder and recorded a rating of approx. 40 (using conversion from likert scale) after a CO_2 challenge. The post-task anxiety ratings for the current study were approximately 29 for both conditions. Similarly, Karekla, Forsyth, and Kelly (2004) measured subjective distress in a non-clinical sample (with low avoidance as measured on the AAQ) and recorded an increase of 36 subjective units of distress from before to after a CO_2 challenge. The increase recorded in the current study for distress was approximately 16. In addition, Kehoe (2008) measured subjective discomfort in a non-clinical sample using radiant heat induction. Participants' mean discomfort rating was 55 after the task, although their mean baseline rating was not recorded. This is moderately higher than the present discomfort ratings, which were approx. 36 post-task. Kehoe also reported subjective anxiety ratings of approximately 26, which were similar to those obtained presently. Taken together, the overlap on these three subjective measures across studies suggests that the stress induction potential of the current manipulations was no less than that obtained with either the CO_2 challenge or radiant heat induction. It is important to note, however, that there are well-established limitations of subjective measures when used as indicators of change in supposed physiological states, and a number of studies have employed direct physiological measures as an alternative (e.g., Wilson, 2009).

A central hypothesis of the current research proposed that the increase in stress measures would be greater in the Multi-Sentence Condition, relative to the Single-Sentence, possibly because the former would generate greater vividness and impact of the imagined scene. However, none of the three key dependent variables showed any notable difference between conditions. The vividness outcome perhaps shed some light on this issue, and demonstrated that the mean vividness rating was significantly greater in the Multi-Sentence Condition (i.e., 52/100 compared to 30/100). Hence, the vividness associated with the longer manipulation was greater than the single sentence alone.

Interestingly, the larger vividness outcome recorded on the Multi-Sentence Condition here was considerably smaller than that recorded by Marcks and Woods (2007) on a

single-sentence manipulation (i.e., 69/100). These differences across conditions and across studies may be accounted for by differences in participant levels of willingness to engage with the scenario. That is, the current data showed significantly greater willingness to engage with the scene by the Multi-Sentence Condition (54/100 compared with 27/100), which may in turn generate greater vividness. Indeed, although Marcks and Woods used only a single-sentence manipulation, they reported high levels of engagement (66/100), similar to those observed here. In short, perhaps level of engagement is more influential on outcomes than length of manipulation, possibly because it relates to vividness.

The present outcome on believability of the scene supports the argument above on vividness. Specifically, the mean believability rating was almost significantly greater than the mean in the Multi-Sentence Condition (36/100 compared with 25/100). It would seem likely that the greater vividness associated with more sentences also increased the believability of the scenario. Interestingly, however, this figure is considerably lower than the mean believability of 66/100 reported by Marcks and Wood (2007).

Rachman *et al*. (1996) proposed that the presence of negative feelings, such as guilt and moral wrongness, may also be critical to attaining increases in stress using the single sentence procedure. Although, the current findings showed some superiority for the Single-Sentence Condition on guilt (52 vs. 42/100) and moral wrongness (60 vs. 48/100), the outcomes on both measures for both conditions were high. Furthermore, both outcomes were consistent with other studies. Specifically, the guilt outcome was similar to Rachman *et al*.'s 54/100, Zucker *et al*.'s (2002) 58/100 and Marcks and Woods' (2007) 43/100. The current moral wrongness outcome was also consistent with other evidence, with both Marcks and Woods (2007) and Zucker *et al*. (2002) reporting a mean of 52/100. Most notably, all of these outcomes were recorded with single sentence manipulations, and the current data indicated that this manipulation was associated with greater guilt and moral wrongness than the longer manipulation. As a result, the findings here may suggest that one reason why the Multi-Sentence Condition is no more effective than the shorter Single-Sentence manipulation is because it begins to reduce feelings of guilt and moral wrongness (or generally negative feelings). In other words, perhaps the longer manipulation facilitates habituation to stress on participants' behalf and this in turn begins to undermine any potential superiority in outcome.

On a related note, it was interesting that willingness and vividness were significantly greater in the Multi-Sentence Condition and believability approached significantly greater, than the Single-Sentence Condition. In short, one might assume that greater believability and vividness would be associated with less, rather than more, willingness. However, if, as suggested above, the longer condition facilitated habituation to stress, then one would not be surprised to find that willingness remained high.

The studies discussed above also shed some light on the unexpected lack of difference observed between the two current conditions. Specifically, Rachman *et al*. (1996) proposed that negative appraisals such as guilt and moral wrongness play a key role in the impact of the single-sentence stress induction task. Indeed, if guilt and moral wrongness exerted an important influence on stress induction and the two current conditions did not differ in the levels of stress induction created, then one would expect to see similar outcomes for both conditions. In short, the data here support Rachman *et*

al. 's (1996) proposal and suggest that negative emotions like guilt and moral wrongness play a more important role in stress induction than variables like willingness or vividness.

In conclusion, the results obtained from the current study demonstrate the utility of Rachman et al.'s original single-sentence paradigm as a brief and robust form of experimental stress induction. The present findings suggest the utility of the procedure across three self-reported forms of stress. The overlap of outcomes on these measures with clinical studies also suggests that the preparation may have utility with both clinical and non-clinical samples. Although brief and simple to use, the procedure also appears to generate adequate levels of participant willingness, vividness, and believability, as well as establishing feelings of guilt and moral wrongness, which may indeed play a key role in the induction of stress. The multi-sentence procedure appears to add little to most of the measures of stress and negative appraisals, with the exception of vividness and willingness, and possibly believability. But, if these differences simply serve the purposes of habituation, then for participants this is simply more of the same as that generated by the single-sentence procedure. In conclusion, we would suggest that at least in terms of the dependent and appraisal variables measured here, the multi-sentence paradigm adds little to its shorter counterpart. However, this issue does suggest the possible utility of comparing the two procedures on a range of different variables.

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