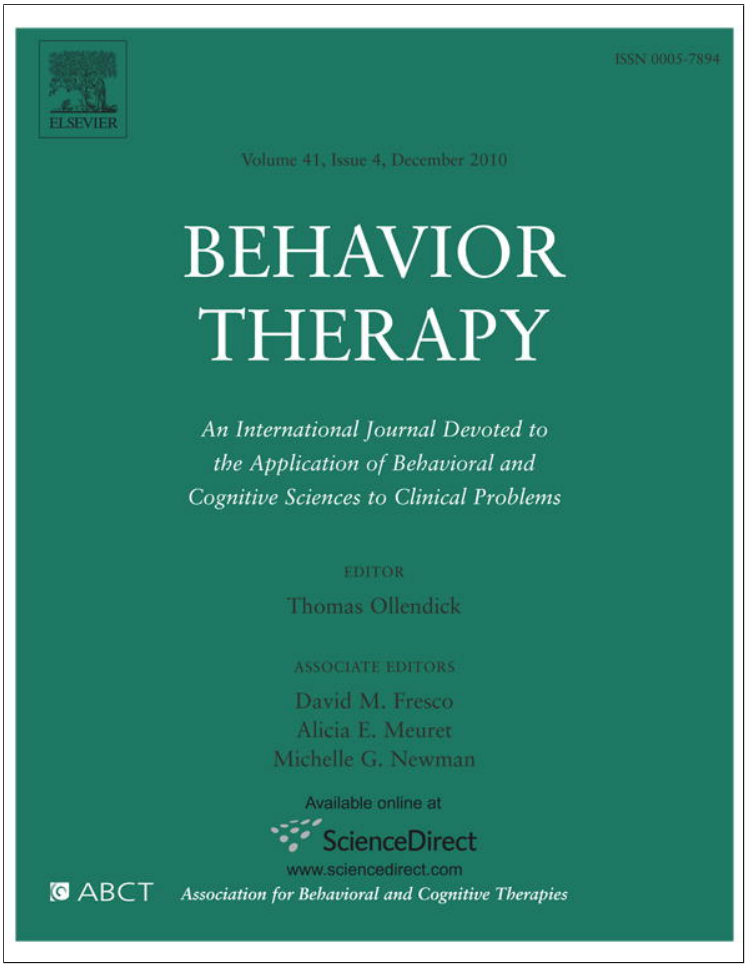

Available online at www.sciencedirect.com
ScienceDirect
Behavior Therapy 41 (2010) 575–586
Behavior Therapy
www.elsevier.com/locate/bt

Cognitive Processing Specificity of Anxious Apprehension: Impact on Distress and Performance During Speech Exposure

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The present study examined the impact of different modes of processing anxious apprehension on subsequent anxiety and performance in a stressful speech task. Participants were informed that they would have to give a speech on a difficult topic while being videotaped and evaluated on their performance. They were then randomly assigned to one of three conditions. In a specific processing condition, they were encouraged to explore in detail all the specific aspects (thoughts, emotions, sensations) they experienced while anticipating giving the speech; in a general processing condition, they had to focus on the generic aspects that they would typically experience during anxious anticipation; and in a control, no-processing condition, participants were distracted. Results revealed that at the end of the speech, participants in the specific processing condition reported less anxiety than those in the two other conditions. They were also evaluated by judges to have performed better than those in the control condition, who in turn did better than those in the general processing condition.

ALTHOUGH EXPOSURE-BASED INTERVENTIONS HAVE been successfully incorporated in the treatment of anxiety disorders, research continues to explore ways for improving their efficacy (Craske et al., 2008; McNally, 2007) and extending the scope of their application (Barlow, Allen, & Choate, 2004). In this area of work, the development of emotion regulation strategies that would be effective during exposure therapy might constitute a heuristic approach (Campbell-Sills & Barlow, 2007). The underlying rationale is that effectively exploring and regulating distressing emotions (that are otherwise avoided) should improve self-efficacy and reduce helplessness and avoidant behavior. In fact, self-efficacy has been shown to be a key mediator of exposure effects (Craske et al., 2008; Mineka & Thomas, 1999).

A promising emotion regulation strategy that has been used in clinical settings is the specification of emotional information—focusing attention on the specific details of a given unique emotional experience. Specification is believed to counteract abstractness and overgenerality in emotional information processing; together, these two characteristics have been evidenced to index subtle forms of dysfunctional cognitive avoidance (Borkovec, 2002; Watkins, 2008). Such processes are known to play a key role in psychopathology (Beck, Emery, & Greenberg, 1985).

Over the last decade, several studies have investigated the effect of specification on emotion regulation. In these studies, specific emotion processing was defined as the voluntary activation of specific and unique episodic information, focusing on the elaboration of the emotional experience with regard to their context and emotional facets (i.e., feelings, sensations, and thoughts; Philippot, Baeyens, & Douilliez, 2006). General emotion processing, on the other hand, was defined as the

The writing of this paper has been facilitated by grants from the Fonds National de la Recherche Scientifique de Belgique and Action de Recherche Concertée.

The authors appreciate helpful comments of Kumar Yogeeswaran and Betty Chang on earlier drafts of this paper.

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0005-7894/10/575–586/$1.00/0

voluntary activation of personal, emotional information centered on generic aspects of the experience; the type of mental states, bodily states, and impressions that typically occur in the emotional situation considered (Philippot et al., 2006). Research in this area has shown that, compared to general processing, specific processing of emotional information leads to less intense emotional feelings (e.g., Philippot et al., 2006; Philippot, Schaefer & Herbette, 2003; Raes, Hermans, Williams & Eelen, 2006), reduced cardio-vascular arousal (Schaefer et al., 2003), and increased self-efficacy (Vanlede, Bourgeois, Galand, & Philippot, 2009). However, no study has yet examined whether these effects can be generalized to an actual stressful experience. If the benefits of specific processing also apply to stressful experiences, then these findings might have useful implications for clinical intervention.

The theoretical rationale underlying this research is based on multi-level theories of emotion (e.g., Dalgleish, 2004; Leventhal, 1984; Philippot, Neumann & Vrielynck, 2007; Teasdale & Barnard, 1993). The basic notion of these theories is that emotional distress results from the automatic activation and maintenance of implicit emotional representations, called associative structures (Dalgleish, 2004) or schemata (Leventhal, 1984).[1] These associative structures consist of abstract and implicit representations that integrate emotional stimuli and responses. The former comprise sensory, perceptual, and semantic information that are typical of a given category of emotional experiences, and the latter refer to the related activation of specific body response systems. Multi-level theories of emotion also postulate that at least one other type of emotion representation exists in parallel to the associative system: a conceptual/propositional system that consists of declarative knowledge about emotion. This system refers to semantic knowledge—what we know about emotion in general—as well as episodic knowledge about our emotional experiences. Representation units of this system are discrete concepts and images about the different elements of emotional situations. Additionally, knowledge at the propositional level can be activated willfully and consciously.

The activation of an associative structure is automatic and tends to maintain itself using several feedback loops. At the perceptual level, the activation of an associative structure lowers the perception threshold for any related stimulus. For instance, it has been well supported that the activation of social anxiety lowers the perception threshold for any sign of social rejection such as frowns (Mogg & Bradley, 2004). This lowered perception threshold for congruent stimuli then strengthens the automatic activation of the associative structure. At the physiological level, the activation of the bodily responses linked to the associative structure feeds back to that structure, both by a central and a peripheral route. Regarding the central route, this circular activation has been described as a neurological "as if" loop in the brain, by which central body makers can reactivate a primary emotion representation (Bechara, 2004). Regarding the peripheral route, a large body of literature has demonstrated that the arousal of a specific bodily state activates the other facets of the corresponding emotion responses, be it via the face (Matsumoto, 1987), posture, (Stepper & Strack, 1993), or respiration (Philippot, Chapelle, & Blairy, 2002).

Finally, the activation of an associative structure automatically primes related conceptual/propositional representations, be it concepts or images. Conversely, the activation of a conceptual/propositional representation related to an associative structure automatically activates the structure. This point can be illustrated by an example in clinical psychology: If someone suffering from social phobia repeatedly interprets his/her social experience as shameful, the concepts and images related to shame become associated with his/her social anxiety associative structure. Consequently, just reading the word "shame" (i.e., the mere activation of that concept) is sufficient to automatically arouse the social anxiety schema.

An important aspect of the theoretical framework just outlined is the strong relation postulated between emotional associative structures and the mental images and concepts that have been prototypically and generically associated with them. These generic concepts and mental images are the most salient and cognitively accessible elements. They are also the elements that are the most likely to be activated in a general mode of processing, as they represent the generic features of a given emotion (Behar, Zuellig, & Borkovec, 2005), e.g. "muscle tension" for anger. By contrast, a specific mode of processing implies focusing on unique, nonprototypical elements of the emotional experience, and aspects that signal its episodic uniqueness. These are elements that only occurred during that specific episode. This mode of processing requires people to disengage their attention from the automatically activated generic/prototypical elements (Heeren, VanBroeck, & Philippot, 2009) and to reallocate it to unique elements that, by definition, are not linked to an associative structure.

[1] Because of the polysemic nature of the concept of "schema," the label "associative structure" will be used in this paper.

In sum, the general mode of processing favors the automatic activation of emotional associative structures by allocating resources to elements that are directly linked to these structures, thereby establishing and maintaining positive feedback loops with associative structures. By contrast, the specific mode of processing deactivates the arousal of associative structures by allocating resources to elements that are not linked to them, and thereby weakens feedback loops with associative structures.

Interestingly, studies that have investigated people's beliefs about the consequences of specifying emotional information have yielded intriguing observations. Philippot and colleagues (2006) conducted a series of studies that investigated people's naïve a priori beliefs about emotional specification (without actually exposing them to the emotional situation). They found that participants believed that specifically processing emotional information while anxiously waiting to deliver a public speech would increase their distress, compared to processing emotional information at a general level. In a subsequent study, the same researchers interviewed individuals diagnosed with social phobia and found that they held the same naïve theory, but with even more negative expectations about the consequences of specific processing. Thus, when confronted with aversive emotional information, people are likely to avoid processing it specifically because of their expectation that such cognitive processing would generate an intense negative emotional state. This avoidance tendency seems to increase as a function of the aversiveness of the information. Because the disruptive emotional information is not properly processed, it is left unchanged (Foa & McNally, 1996; Stöber & Borkovec, 2002) and is likely to be automatically reactivated. This lack of processing might eventually constitute a maintenance factor for emotional disorders (Clark, 1999).

From the theoretical and empirical evidence described above, it follows that enhancing a specific mode of processing could be beneficial in exposure interventions, especially since people seem to have a natural tendency to process aversive information at a general level. Enhancing a specific mode of processing should not only enhance emotion regulation by preventing the establishment of feedback loops with associative structures, but it should also promote a more realistic and complete perception of the situation. Indeed, while a general mode of processing monopolizes attention to prototypical elements (hence, applying a stereotype to the situation), specific processing entails the allocation of attention to all elements that are actually present in the situation. It therefore results in a more precise, complete, and realistic view of the situation, compared to using general processing. Indeed, Pollock and Williams (2001) have evidenced that the tendency to access emotional information at an overgeneral level is related to poor problem-solving skills. Additionally, specific processing should result in more adaptive and realistic coping with future similar situations. For example, Taylor, Pham, Rivkin, and Armot (1998) found that asking students to imagine the particular difficulties they might encounter while studying for their exams had a beneficial effect on their academic performance, as compared to students who imagine themselves succeeded in their exams. The notion that it is beneficial to pay attention to all the specific and unique elements of an emotional experience is also congruent with psychological interventions based on acceptance and mindfulness (Hayes, Follette, & Linehan, 2004; Segal, Williams & Teasdale, 2002). In this perspective, Hofmann, Heering, Sawyer, and Asnaani (2009) have observed that, as compared to expressive suppression, acceptance and reappraisal lessened the cardiovascular tall of anxiety induced by an impromptu speech. These authors, however, suggest that acceptance might be less effective in moderating the subjective report of anxiety than reappraisal.

Previous studies that examined specific versus general processing have mostly relied on emotion induction via mental imagery or exposure to film excerpts (Neumann & Philippot, 2007; Philippot, Schaefer, & Herbette, 2003). Additionally, few studies have actually examined the effect of manipulated specificity of processing during in vivo exposure (Philippot, Baeyens, & Douilliez, 2006; Vrielynck & Philippot, 2009). No study to date has investigated whether promoting specific processing improves actual performance during a distressing emotional experience. The purpose of the present study is to examine whether promoting specific processing of an anxiety-provoking situation decreases distress and improves speech performance during a subsequent in vivo exposure. Additionally, the present study also aims to compare people's naïve beliefs about the outcome of specification/generalization to the actual effects of these modes of processing. Indeed, these two aspects (beliefs versus actual effects) have never been observed in the same individuals for a given emotional experience.

Specifically, our predictions were (a) that participants would expect specific processing of anxious apprehension to induce more anxiety than general processing, (b) that contrary to this belief, participants in the specific processing condition would experience less anxiety than those in a general or no processing (control) conditions, and (c) that the

positive effect of specific processing would extend to increases in self-efficacy and in a better speech performance.

Method

OVERVIEW AND DESIGN

The experiment took place in two sessions. In Session 1, participants were screened for compliance with the inclusion criteria and filled out questionnaires assessing anxiety and depression. During this session, they were also asked about their naïve beliefs about the emotional consequence of processing in a specific versus general mode when expecting to deliver a speech. In Session 2, participants had to give a difficult speech while being videotaped for further evaluation. Before the speech, they were invited to take part in a stress management task allegedly designed to diminish their anxiety. Based on the experimental condition to which they were randomly assigned, participants were conducted to adopt either a general processing mode, a specific processing mode, or they completed a distracter task (control condition). All participants reported their emotional state at baseline, before the speech, and after the speech. They also self-evaluated their performance. Finally, their videotaped speech was rated by two judges for overt signs of anxiety and impaired performance.

PARTICIPANTS

Sixty-four university students (32 women and 32 men) between the ages of 18 and 27 years (mean = 21.9) were recruited through local advertisements and took part in the experiment for 5€. They were all white Caucasians. In Session 2 of the study, they were randomly assigned to one of the three experimental conditions: general, specific, or control. There were no differences among the conditions in terms of age, $F(2, 63) = 1.86$, *ns*, or gender, $\chi^2(62) = 0.82$, *ns*. Four participants did not show up for the second session (one in the general condition and three in the control condition) and were therefore excluded from all analyses.

MATERIALS

The State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), the Zung Self-Rating Depression Scale (ZUNG; Zung, 1965), and the Fear of Negative Evaluation (FNE; Watson & Friend, 1969) measures were used to assess trait anxiety, level of depressive symptoms, and level of social anxiety, respectively. The French version of the Mini International Neuropsychiatric Interview (MINI; Lecrubier, Weiller, Bonora, Amorin, & Lépine, 1994) was used to determine whether participants met the *DSM-IV* criteria for major depressive disorder, dysthymia, or social phobia. We selected these diagnoses as (a) social phobia is the condition that is most likely to be affected by the experimental context (stressful speech performance) and (b) depression is the most comorbid condition to social phobia.

The Differential Emotion Scale (DES; Izard, Dougherty, Bloxom, & Kotsch, 1974; French validation, Philippot, 1993) was used to assess the emotional profile that participants anticipated to experience during the subsequent speech exposure. The DES includes 10 emotional state items (*attentattentive, joyful, sad, angry, fearful, anxious, disgusted, contemptuous, surprised,* and *happy*) that are rated in terms of intensity on a 5–point scale anchored from 0 (*not at all*) to 5 (*completely*). It provides a good measure of emotional profile but not of emotional intensity (Philippot, 1993).

Visual Analogue Mood Scales (VAMS; McNally, Litz, Prassas, Shin, & Weathers, 1994) includes seven 9-point scales corresponding to different mood adjectives: *happy, anxious, in a bad mood, angry, sad, emotionally aroused,* and *in a positive mood*. Participants were asked to indicate the extent to which they felt each emotion on a scale of 1 (*not at all*) to 9 (*extremely*). It provides a sensitive measure of the intensity of different emotions.

The Behavioural Assessment of Speech Anxiety (BASA; Mulac & Sherman, 1974) was used to assess overt signs of speech anxiety. The BASA includes 17 overt manifestations of anxiety during speech performance, divided into 5 categories (*vocal qualities, verbal fluency, throat, facial expressions, bodily movement: arms and hands*). Two independent judges rated the presence and intensity of these 17 manifestations of anxiety on a 10-point scale from 1 (*not at all)* to 10 (*strongly*), based on the videotapes of speeches given by the participants during the experiment. An overall score for each participant was computed by each coder; these scores were highly correlated, $r(60) = 61$, $p < .001$. They were averaged to create a total BASA score (Cronbach's $\alpha = .52$).

The following additional scales were designed ad-hoc for this particular experiment.

The Emotional Distress Scale is a single-item scale reflecting distress changes on a bimodal 7-point scale (from *emotions would strongly decrease* to *emotions would strongly increase*).

The Imagery Success Scale requires participants to rate how clearly and vividly they were able to mentally imagine their emotional state and its evolution following a mental imagery task. This is rated on a single-item 5-point scale anchored from 0 (*not at all*) to 5 (*completely*).

The Topic Knowledge Scale is a single-item 5-point scale ranging from 1 (*very bad)* to 5 (*very good*), on which participants indicate their knowledge of a given topic.

The Anxiety Scale is a single-item 9-point scale indexing anxiety ranging from 1 (*no anxiety)* to 9 (*very intense anxiety*).

The Speech Performance Scale is a single-item 7-point scale on which participants judge how well they perform a speech (1 = *very bad* to 7 = *very good*).

The Speech Stress scale is a single-item 67-point scale on which participants report their level of stress during the speech (from *not at all* to *very much*).

Manipulation check

In order to check whether participants correctly followed the instructions during the experimental manipulation, two independent judges, one of which was blind to the experimental conditions, coded each audiotaped response of the participants on an 11-point scale, anchored from -5 (*very general*) to +5 (*very specific*). These scores were then averaged to create a specificity score (Cronbach's $\alpha = .97$).

PROCEDURE

The study took place in two separate sessions, which were a week apart. Each session lasted for about 35 minutes on average, and each participant completed the procedure individually. The first session was designed to examine whether participants held a naïve theory about how processing specificity modulates emotional intensity in stressful speech situations. The second session was designed to test participants' theory in vivo, by having them anticipate and perform an oral presentation in front of a camera, for the alleged purpose of a later evaluation.

First Session

After participants had given their written informed consent, they were administered the STAI, the FNE, and the ZUNG. Participants also verbally completed the section of the MINI pertaining to major depressive disorder, dysthymia, and social phobia (Lecrubier, Weiller, Hergueta, Amorin, Bonora, & Lépine, 1999).

Participants were then asked to imagine that they were in the next session, where they would give a speech in front of a camera, knowing that this speech would be evaluated by experts. They were invited to imagine themselves waiting to give the speech, and then to indicate their emotional state using the DES. Next, participants were invited to imagine that, as they were waiting to give the speech, they would have to perform a stress management task in which the experimenter would ask them different questions for 10 minutes. These questions were presented to them in writing. In the specific processing condition, participants were invited to detail precisely their thoughts, images, physical sensations, and emotions. In the general condition, they were invited to think at a general level about their thoughts, images, physical sensations, and emotions. In a control distraction condition, they were instructed to find antonyms for a list of neutral words. Each participant completed the tasks for all three conditions, and the order of task presentation was randomized. Immediately after reading these instructions, participants had to predict how the intensity of their emotional distress would evolve as a function of each of these processing conditions, using the Emotional Distress Scale. Furthermore, participants indicated on the Imagery Success Scale how successful they had been in mentally imagining their emotional state and its evolution in that situation.

Second Session

A week after the first session, the same participants returned for the second session of the study. Upon their arrival in the laboratory, participants were reminded that the purpose of this second session was to assess oral presentation abilities in different populations. The experimenter emphasized the importance of such abilities for social and professional success. Participants were then told that they would have to give an oral presentation about an international topic in front of a camera. They were also told that this presentation would later be evaluated by a panel of experts. Participants were then presented with three topics for which they were asked to report their level of knowledge on the Topic Knowledge Scale.

Afterwards, participants were told that, since speaking in front of a camera is stressful for most people, they would have to complete a 5-minute "stress management task" before the speech. The experimenter informed them that this training was supposedly one of the best ways of coping with stress in such situations. Participants were then given the topic of the presentation (unbeknownst to them, the experimenter chose the topic for which they reported that their knowledge was the poorest). The presentation topics were equally distributed in each condition.

Participants were then seated in a comfortable armchair. They were asked to close their eyes, and to concentrate on the images, thoughts, physical sensations, and emotions that they would feel while they were waiting to speak in front of the camera. They were then asked to complete the VAMS and the Anxiety Scale.

Then, based on the condition to which they were assigned, participants performed one of three tasks

as part of their "stress management task" session: a specific processing task, a general processing task, or a distraction task. For the two experimental tasks, participants had to verbally answer for 5 minutes a series of questions regarding their anxious apprehension about the speech (for the complete listing of questions, see Appendix A). For example, in the specific processing condition, participants had to respond to questions requiring them to specify as precisely as possible their thoughts, emotions, physical sensations, etc., about the speech (e.g., "Could you describe and detail the body sensations that you are feeling now that you know you will soon have to speak in front of a camera?"). In the general processing condition, participants answered questions about the thoughts, emotions, physical sensations, etc., that they typically experience in this situation as well as in most situations in which they have to perform a speech (e.g., "What are the bodily sensations that you generally feel when you have to speak in public?"). In the control condition, participants had to give antonyms to a series of nonemotional words (e.g., "small/big").

Immediately after the "stress management task" task, participants completed the VAMS and the Anxiety Intensity Scale. The experimenter switched on the camera and invited participants to sit down on a chair in front of it. They were then asked to speak for 3 minutes about the topic they had been assigned. They were informed that they had to speak for the entire 3 minutes, even if they had to repeat themselves or go off-topic.

After the speech, participants once again completed the VAMS and the Anxiety Scale with respect to their emotional state during the speech. They were also asked to fill in the Speech Stress and Speech Performance scales. In order to check whether participants guessed the purpose of the study, the experimenter asked them whether they had an idea about the topic and the hypotheses of the study. No participant guessed the real purpose of the study. Finally, participants were thanked, fully debriefed, and invited to ask any questions.

DATA ANALYSES

All analyses were performed with SPSS 16. The main analyses consisted of ANOVAs with experimental condition (specific processing, general processing, or control) as a between-participants factor, and time (baseline, before the speech, and during the speech) as a within-subject factor when measurement was repeated. Huynh-Feldt correction was used for repeated measures. Post-hoc comparisons used the Bonferroni procedure. ANCOVAs were also used with the same factors of experimental condition and time. Specificity ratings (manipulation check) were entered as a covariate in order to examine whether differences in specificity of processing accounted for the between-group differences observed in the dependent variables.

The analyses proceeded in several steps. First, we checked whether the three experimental groups (general processing, specific processing, and no processing/distraction) were equivalent on the depression, anxiety, and social anxiety scales. Then, participants' beliefs regarding the efficacy of the three processing modes (general, specific, no processing) were tested with a one-way ANOVA. Replicating previous reports (e.g. Philippot et al., 2006), it was expected that participants would anticipate that the specific processing mode would induce more anxiety than the general or no processing modes. Next, the actual performance of the participants, that took place in Session 2, was examined. Participants' anxiety intensity and emotional profiles were examined for the periods before and after the stress management task, and during speech performance. It was expected that anxiety would be less intense during speech performance in the specific processing condition, compared to the general and no processing conditions. Finally, speech performance as evaluated by (a) the participants and (b) independent judges was compared across conditions. Participants in the specific processing condition were expected to perform better than participants in both the other conditions.

Results

SESSION 1

Group Equivalence

ANOVAs were conducted on the scores of the STAI (mean = 42.81, $SD = 9.20$), FNE (mean = 15.69, $SD = 7.19$), and ZUNG (mean = 44.06, $SD = 9.05$) using experimental condition as the between-subjects factor. These ANOVAs showed no group differences (all $F < 1$) on any of these dependent measures. The experimental groups can thus be considered as similar in terms of their general level of anxiety, social anxiety, and depression. On the MINI, three participants (one in each condition) fulfilled the criteria for having a present major depressive episode, one (in the general condition) fulfilled the criteria for having a past major depressive episode, one (in the distraction condition) fulfilled the criteria for dysthymia, and one (in the specific condition) fulfilled the criteria for social phobia.

Participants' Expectations

During the first session, participants had to imagine that they were in the next session, in which they

would have to give a speech. Analyses of the DES items from this task showed that participants anticipated that, while they were waiting to give the speech, they would be attentive ($M = 4.05$, $SD = .12$), anxious ($M = 3.55$, $SD = .14$), fearful ($M = 2.47$, $SD = .15$), but also somewhat amused ($M = 2.64$, $SD = .14$). No group differences were observed (all $F < 1$).

By contrast, analyses on the Emotional Distress Scale revealed that participants expected clear differences in how their anxiety would evolve according to the processing mode that they would engage in during the stress management task, $F(2, 124) = 27.66$, $p < .0001$, partial $\eta^2 = .301$. They predicted specific questioning to enhance their anxiety ($M = 4.80$, $SE = .20$, CI = 4.38–5.20), distraction to diminish it ($M = 2.98$, $SE = .19$, CI = 2.61–3.36), and general questioning to have no effect on the efficacy of their stress management task ($M = 3.84$, $SE = .19$, CI = 3.46–4.22). Post-hoc analyses ascertained that each condition differed from each other in expected emotional distress. Again, no group differences were observed (all $F < 1$).

SESSION 2

Manipulation Check

An ANOVA on the specificity ratings revealed that participants in the specific processing condition were clearly more specific ($M = 1.92$, $SD = .93$) than participants in the general processing condition ($M = -2.27$, $SD = .59$), $F(1, 38) = 286.58$, $p < .0001$, partial $\eta^2 = .883$.

Emotional Changes

The level of anxiety measured on the single-item 9-point scale was analyzed using a mixed-design 3 (Condition) × 3 (Time) ANOVA. This analysis revealed a significant effect of time, $F(2, 114) = 23.36$, $p < .0001$, partial $\eta^2 = .291$, and an interaction of time with condition, $F(2, 114) = 3.97$, $p < .005$, partial $\eta^2 = .122$. As can be seen in Table 1, anxiety decreased at the end of the speech in all conditions, but this decrease was greater in the specific processing condition. Further analyses were conducted to investigate whether the interaction was accounted for by the level of specificity that participants exhibited during the stress management task. Indeed, specificity ratings were negatively correlated with anxiety at the end of the speech, $r(40) = -.32$, $p < .05$, but not with anxiety at baseline or just before the speech ($p > .05$). An ANCOVA using the same factors as the ANOVA just described, and the specificity ratings (manipulation check) as a covariate was computed on the data of the specific and general processing groups. This ANCOVA revealed that the effect of the Time × Group interaction disappeared when controlling for differences in specificity of processing, $F(2, 74) = .26$, $p > .77$, showing that this effect is accounted for by the level of specificity of processing.

Table 1
Mean Anxiety as a Function of Experimental Condition and Time

Condition	Time		
	Baseline	Before Speech	End of Speech
Specific processing	5.25_a (2.00)	5.00_{ab} (1.41)	3.00_c (1.86)
General processing	5.75_a (1.33)	5.50_a (1.32)	4.25_b (2.04)
Distraction	5.30_a (1.45)	4.30_b (1.69)	4.45_b (1.85)
Total	5.43 (1.61)	4.93 (1.54)	3.90 (2.00)

Note. Range from 1 to 9; *SD* in parenthesis. Sharing at least one subscript indicates no mean differences between conditions.

A second mixed-design ANOVA analyzed the effect of Time × Emotion × Condition on VAMS ratings. Time (baseline, before the speech, and during the speech) and Emotion (the 7 items of the VAMS) were within-individual factors, and Condition was the between-individuals factor in this analysis. The mixed ANOVA revealed a significant main effect of Emotion, $F(6, 684) = 136.58$, $p < .0001$, partial $\eta^2 = .706$, and significant interaction effects of Emotion × Time, $F(12, 684) = 14.83$, $p < .0001$, partial $\eta^2 = .206$, and Emotion × Condition × Time, $F(24, 684) = 1.93$, $p < .005$, partial $\eta^2 = .063$. These second-order interactions, which are central to the present study, suggest that the emotion profile did not differ among conditions at baseline or just before the speech. After the speech, however, the anxiety item of the VAMS was modulated by condition, $F(2, 57) = 6.78$, $p < .002$, partial $\eta^2 = .192$ (simple interaction effect), such that participants showed significantly less anxiety in the specific processing condition ($M = 2.60$, $SD = 1.70$), than in either the general processing condition ($M = 4.15$, $SD = 1.63$), or the distraction control condition ($M = 3.77$, $SD = 1.93$; all $ps < .01$). No other item of the VAMS was modulated by condition.

Finally, it was examined whether there was any relation between people's beliefs about the effect of processing mode, as measured in Session 1, and the actual evolution of their anxiety during speech performance. Within-condition correlations were computed between two variables. One variable was participants' beliefs about how much distress they would feel in each of the processing conditions (specific, general, and no processing/distraction), as measured by the Emotion Distress Scale. The other variable was participants' change in anxiety from

the baseline phase to after their speech was given (computed as the score on the Anxiety Scale at the end of the speech minus the score on the Anxiety Scale at baseline). None of these correlations approached significance ($-.12 < r < .21$; all $ps > 38$).

Speech Performance

As mentioned in the procedure, immediately after their speech, participants were asked to evaluate their own speech performance. A one-way ANOVA using Condition as the between-subjects factor revealed that the experimental groups tended to differ in their performance evaluation, $F(2, 56) = 2.89$, $p < .07$, partial $\eta^2 = .094$. Participants in the control condition ($M = 8.05$, $SD = 1.81$) tended to evaluate their performance as better than participants in the general processing condition ($M = 6.50$, $SD = 2.14$), Bonferroni $p < .07$, while participants in the specific processing condition ($M = 7.60$; $SD = 2.56$) did not differ from the two other groups. Furthermore, this perceived performance evaluation was correlated with the specificity level (manipulation check) as measured in the general and specific processing conditions, $r(40) = .38$, $p < .015$. This means that the more specifically participants had processed their anxious apprehension during the stress management task, the more positively they judged their speech performance to be.

Overt Anxiety

Two independent judges used the BASA scale to assess overt anxiety. A one-way ANOVA then compared mean differences in overt anxiety across the three experimental conditions in the study and found significant differences between the three experimental conditions, $F(2, 57) = 3.65$, $p < .04$, partial $\eta^2 = .11$. Post-hoc analyses showed that less overt anxiety was observed in the specific processing group ($M = 7.81$, $SD = 1.42$) than in the general processing ($M = 9.04$, $SD = 1.65$) or control group ($M = 8.48$, $SD = 1.19$; all $p < .03$). Similar to the self-evaluation of speech performance, the BASA total score (reflecting overt anxiety observed by judges) was negatively correlated with the specificity level as measured in the general and specific processing condition, for both conditions together, $r(40) = -.48$, $p < .002$. This means that, as participants were more specific in their processing during the stress management task, they displayed less overt anxiety when performing their speech. As expected, this correlation was particularly significant within the specific processing condition, $r(20) = -.55$, $p < .02$; while, although in the right direction, it did not reach significance in the general processing condition, $r(20) = .-34$, $p < .14$. An ANCOVA was also used to compare the general and specific processing conditions, with specificity level (manipulation check) as a covariate. When specificity of processing was controlled, the effect of condition disappeared, $F(1, 37) = 2.53$, $p < .12$, partial $\eta^2 = .06$. It should be noted that participants' evaluation of their self-perceived performance is correlated with the observed BASA score, $r(60) = -.39$, $p < .002$.

Discussion

The results of the present study replicate two key findings from previous research. First, people's spontaneous expectation or naïve belief is that specifying a distressing emotional experience intensifies the emotion aroused, as compared to activating general thoughts about it, or distracting oneself from it. Although the procedure of the present study differs from that of previous studies, the present observation replicates their findings (Philippot et al., 2006). Second, as already reported in several past studies (for a review, see Philippot et al., 2007), specifying anxiety-inducing information lessened the anxiety aroused.

Beyond these replications, the present study is the first to measure a participant's naïve theories about specifying emotional information in a distressing situation, and the actual effects of specifying emotional information in such a situation. The present results show that actual specification had the exact opposite effect (i.e., distress decrease) to that which participants expected (i.e., distress exacerbation). It should be noted that the correlation between people's expected changes in anxiety for each of the processing conditions, and actual anxiety reduction in each condition (the difference in anxiety between baseline and speech) did not even approach a statistical tendency. This result suggests the absence of a relation between these naïve theories and actual experience. The effects of specific processing on distress regulation reported here are thus even more remarkable given that they were observed in individuals who reported precisely the opposite expectations.

One might wonder why a naïve theory, disconfirmed by actual evidence, would subsist. One possible explanation is that a naïve theory which assumes that specific processing increases emotional intensity may discourage people from processing emotion in a specific mode, and thus they consequently fail to accumulate evidence disconfirming the theory. Another, yet not mutually exclusive possibility, is that distressing emotions are often accompanied by vivid and specific intrusive images that are very aversive, and often automatically activated. People may not be able to distinguish

between the automatic activation of specific intrusions, on the one hand, and the voluntary, effortful process of focusing on the unique elements of a situation that is involved in specific processing, on the other hand. The former, automatic, process would offer incorrect but vivid experiential support of the naïve theory that specific processing increases emotional intensity. Given that intrusions in pathological states are often specific and emotionally intense, this possibility is even more likely in people suffering from an emotional disorder. These two explanations (the lack of discomfirmatory experience and the experience of emotionally vivid and specific intrusions) offer a rationale for the maintenance of dysfunctional emotional avoidance and related beliefs.

Importantly, the present study reports the first empirical evidence that the positive effect of specific processing extends to actual behavioral performance. The observed speech performance, as measured by the BASA, revealed that participants in the specific processing condition showed fewer signs of anxiety during their speech than participants in the two other conditions. Moreover, both correlational and covariance analyses suggest that processing specificity (as assessed by judges from the recording of the "stress management task") accounts for the differences in performance. The more specific participants were in processing their anxious apprehension, the fewer signs of overt anxiety they displayed during the speech. The self-evaluation of performance followed the same trend, although it was only marginally significant. It may be that self-evaluation of performance was difficult for participants given that most of their attention was drawn by the speech. Nevertheless, their self-evaluated performance was also significantly correlated with the level of specificity in processing anxious apprehension. In sum, the different analyses conducted converge in suggesting that the level of specificity in processing anxious apprehension had a direct impact on subsequent speech performance.

It should be noted that, in the present study, a slight reduction of anxiety was observed immediately after the processing manipulation in the distraction condition, but not in the two other conditions. However, at the end of the speech, participants in the distraction condition reported more anxiety than those in the specific processing condition. Still, this pattern of results is slightly different from the one reported by Philippot and colleagues (2006). The procedure of that previous study is similar to the present one, except that the experiment ended immediately after the manipulation, and thus participants did not actually deliver a speech. Philippot and colleagues (2006) observed a slight (and nonsignificant) increase of anxiety in the general processing condition, no change in the distraction condition, and a sharp decrease in the specific processing condition. Hence, it seems that the effect was delayed in the present study as compared to the previous study. An alternative explanation for why participants felt more anxiety in the distraction condition of the present experiment than in the previous experiment is that the anxiety induction was stronger in the present experiment: The experimenter was a graduate student (as opposed to an undergraduate in the previous study), the situation was more realistic, and the imminence of the speech was more salient immediately after the manipulation.

One could argue that the difference in distress observed between the general and specific processing conditions might result from the fact that the specific processing condition provides participants with more extensive, image-based exposure to the experience of giving a speech, and that general processing might constitute a form of subtle avoidance. Several arguments refute these alternative interpretations. First, by definition, the general processing condition consists in exposing participants to the core elements of their social fear schema as defined by Lang (1993). In this perspective, the present general processing condition is akin to the classic exposure recommendations of Foa and McNally (1996) and cannot be considered as a form of avoidance. Second, both conditions imply the same amount of exposure to elements relevant to the speech situation, they only differ in terms of the specificity/generality of these elements. Third, as mentioned in the preceding paragraph, anxiety levels were similar in both the general and specific conditions immediately after the manipulation, and the levels in both these conditions were higher than in the distraction condition, suggesting that participants exposed themselves to anxiety equally vividly in both experimental conditions. Fourth, in another study using the same processing manipulation, vividness of imagery was assessed during specific and general processing (Vrielynck & Philippot, 2009). Interestingly, while specific processing resulted in less distress than general processing, the two conditions did not differ in terms of vividness. This pattern of results suggests that participants in both conditions exposed themselves equally vividly to the situation. Despite no apparent differences in the vividness and emotional intensity between the specific and general modes of processing, the two modes of processing nevertheless resulted in contrasting emotional consequences.

One might also suggest that, under the specific processing instruction, anxiety may be decreased not by specificity itself, but by the fact that specific processing might entail more linguistic processing than general processing. Indeed, Lieberman et al. (2007) have observed that verbal labeling of threatening stimuli disrupts the activity of the amygdala and reduces the intensity of the subjective experience. However, it is not clear whether specific and general processing differ in the extent to which they elicit verbalization. Participants talked about their anxiety apprehension for a similar period of time in both conditions. However, in the specific condition, participants are likely to have activated a more diverse range of verbal material than in the general condition, in which they described prototypical emotions. In actuality, this very process (the activation of a diversified network for representing emotions) is at the heart of the specific processing effect presented in the introduction, within the framework of multi-level models of emotion. Another concern is that specific processing might have induced more unconscious reappraisal that general processing (Williams, Bargh, Nocera & Gray, 2009). Although we have demonstrated in a preceding study that explicit reappraisal is not accounting for the effect of specific processing (Philippot et al., 2006), we cannot rule out a possible mediation by unconscious reappraisal.

In sum, the present data suggest that focusing attention on the specific details that make an emotional experience unique is a beneficial emotion regulation strategy. Specific processing decreases emotional intensity and boosts performance in anxiety-provoking situations. Previous research has also shown that it diminishes cardiovascular activation (Schaefer et al., 2003), and that the decrease in feeling intensity is not modulated by the vividness of the emotional experience (Vrielynck & Philippot, 2009). In other words, specific processing does not seem to entail emotional numbing. It is likely that specific processing results in a more realistic and complete perception of the emotional situation, which in turn leads to more adaptive behavior. Such a notion has also been developed in the line of research investigating mindfulness training as a psychotherapeutic intervention (e.g., Hayes et al., 2004; Segal et al., 2002).

In fact, the present data can be interpreted as a test of one particular process that might be active in mindfulness intervention: the focus on specific and actual aspects of ongoing experience. Indeed, mindfulness-based interventions recruit many different processes, such as attentional training, relaxation, acceptance, etc. (for reviews, see Baer, 2003; Philippot & Segal, 2009) and it is difficult to disentangle the specific contributions of each. The present study constitutes a first step in establishing that a specific component trained in mindfulness interventions, the focus on specific and actual aspects of ongoing experience, might operate to alleviate emotional distress and promote effective behavior during emotional exposure.

Several limitations of the present study need to be acknowledged. First, the study was conducted on a nonclinical student population. It is still to be verified whether the effect of specific processing can be generalized to a population suffering from emotional disorders. Preliminary evidence from our laboratory suggests that the benefits of specific processing also apply to clinical populations: Vrielynck, Philippot, and Rimé (2010) have shown that trauma survivors who processed the narrative of their trauma in a specific mode experienced less distress and intrusions than those who processed their narrative in a general processing mode. Still, these results need to be replicated and extended to performance with a clinically anxious population. The second limitation of the study is that the processing manipulation took place before exposure to the emotional experience of giving a speech. It is not known whether the mode of processing induced during the anticipation of giving a speech maintained itself during the actual performance of the speech. There is some indication that such manipulations can extend to subsequent tasks (e.g., Watkins, Teasdale, & Williams, 2003), but future studies should explicitly examine this issue. The third limitation is that the study was comprised of only one single exposure session. Although several reviews of exposure studies have shown that most changes are already observable in the first session of exposure (Craske et al., 2008; Foa & McNally, 1996), it would be of interest to see whether the effects of processing mode can extend to repeated exposure episodes.

To conclude, although experimental research in this area has certainly a large agenda to meet, enough empirical data have already been accumulated to advise clinicians to promote specific processing (as defined here) during emotional exposure. More precisely, this implies training clients to focus on the specific and episodically unique aspects of their experience during emotional confrontation, the main objective being to promote emotional exploration rather than to control emotional intensity. This approach of exposure has been proposed by Barlow in his new integrative treatment of emotional disorders (e.g., Barlow et al., 2004).

Appendix A. Questions Used in the Specific and General Processing Manipulation

SPECIFIC PROCESSING QUESTIONS

- Could you describe and detail the body sensations that you are feeling now that you know you will soon have to speak in front of a camera?
- Could you describe and detail one by one your thoughts in relation to this situation of being videotaped while you speak?
- Could you describe, one by one, as precisely as possible, the different emotions you are feeling now?
- When you heard you would have to speak in front of a camera, could you tell what was the first emotion you felt, the most intense one?
- What are the mental images that spontaneously pop into your mind? Could you describe them in detail, one by one.
- What could happen during your talk, what are the possible scenarios? What would be your reactions for each of these possibilities?

GENERAL PROCESSING QUESTIONS

- What are the bodily sensations that you generally feel when you have to speak in public?
- What thoughts do you generally have in such situations?
- What kind of emotion do you generally feel when you have to speak in public?
- Which general images pop spontaneously into your mind when you think of this type of experience of speaking in front of a public?
- What are, in general, your reactions when you have to express yourself in front of a public?
- What type of general atmosphere does this type of situation evoke for you?

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RECEIVED: March 12, 2009
ACCEPTED: April 8, 2010
Available online 25 June 2010