Emotional intensity reduces later generalized anxiety disorder symptoms when fear of anxiety and negative problem-solving appraisal are low

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ABSTRACT

While research based on the emotion dysregulation model indicates a positive relationship between intense emotions and generalized anxiety disorder (GAD) symptoms, emotion-focused intervention involves the use of techniques to enhance emotional experiences, based on the notion that GAD patients are engaging in avoidance strategies. To reveal the conditions under which intense emotions lead to reduced GAD symptoms, we designed a longitudinal study to monitor changes in GAD symptoms among students ($N = 129$) over 3 months. Our focus was on possible moderators of the effect of emotional intensity. Results indicated that when fear of emotions and negative appraisals about problem solving were low, negative emotional intensity reduced later GAD symptoms. Moreover, under the condition of high responsibility to continue thinking, emotional intensity tended to reduce later GAD symptoms. Results suggest that reduced fear of emotions and reduced negative appraisals about problem solving may enhance the use of emotional processing techniques (e.g., emotional exposure). The interaction between responsibility to continue thinking and emotional intensity requires further examination.

Generalized anxiety disorder (GAD) is debilitating and difficult to treat, and is characterized by long-lasting, pervasive, and uncontrollable worrying (Andrews et al., 2010). Although there is evidence supporting the efficacy of cognitive behavioral therapy (CBT) in treating GAD, there is room for improvement (for a meta-analysis, see Cuijpers et al., 2014; Hanrahan, Field, Jones, & Davey, 2013). Therefore, further understanding of the etiological process is required, especially with regard to investigating mechanisms related to emotions, because although techniques for enhancing emotional processing are recommended in recent theories (Borkovec & Sharpless, 2004; Mennin, 2006), there is considerable theoretical debate over the function of worry and emotion in GAD, which means that the optimal target of exposure in treatment is not always clear (Newman & Llera, 2011).

There are several theoretical models of GAD, many of which postulate avoidance of emotions as being among the etiological factors (Behar, DiMarco, Heckler, Mohlman, & Staples, 2009). The avoidance model developed by Borkovec, Alcaine, and Behar (2004) considers worry as a maladaptive strategy used to suppress emotional arousal via the mechanism of verbal-linguistic thoughts, as opposed to imagery. The emotion dysregulation model of Mennin, Heimberg, Turk, and Fresco (2005) aimed to extend the avoidance model, proposing that the following four components of emotion dysregulation lead to emotional avoidance in GAD: heightened intensity of emotions, poor understanding of emotions, negative appraisal of emotions, and lack of efficient control over emotions. Among these four factors, heightened intensity and lack of control over emotions are especially strong predictors of GAD (e.g., Mennin, Holaway, Fresco, Moore, & Heimberg, 2007; Mennin, McLaughlin, & Flanagan, 2009; Stapinski, Abbott, & Rapee, 2010; Turk, Heimberg, Luterek, Mennin, & Fresco, 2005). This model led to the development of emotion regulation therapy (Mennin, 2006), wherein the focus is enhanced emotional awareness, skills training for adaptive regulation, and emotional exposure.

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1. Expected longitudinal interaction of emotional intensity with emotional avoidance

Emotion-focused intervention seeks to use intense emotions to treat a problem that is related to intense emotions. Therefore, it is important to clarify the contexts in which intense emotions heighten or reduce GAD symptoms. Although cross-sectional evidence has indicated that there is a link between emotional intensity and GAD, the relationship between the two factors may be rather complicated. Newman and Llera (2011) reviewed evidence indicating that worrying does not dampen emotions but, contrary to the expectation of avoidance theory, actually intensifies them (e.g., McLaughlin, Borkovec, & Sibrava, 2007). Therefore, it is expected that the cross-sectional evidence will reflect, at least in part, the effect of continued worrying on intense emotions. On the other hand, the application of emotional processing techniques (e.g., emotional exposure) for treating GAD considers that fully experiencing emotions without trying to avoid these leads to reduced GAD symptoms (Foa & Kozak, 1986; Mennin, 2006). Even if worrying does not reduce anxiety, GAD patients may still use avoidance strategies (c.f., Newman & Llera, 2011). Therefore, when avoidance attempts are reduced, increased emotional intensity may indicate successful emotional processing (Foa & Kozak, 1986), thus reducing GAD symptoms.

Based on this reasoning, it is expected that emotional intensity may reduce GAD symptoms under the following two conditions: (a) if it is measured preceding GAD (longitudinally) and (b) if emotional avoidance is low. If these conditions are not met, it may be that emotional intensity is related to increased GAD symptoms, as repeatedly found in previous cross-sectional studies (e.g., Mennin et al., 2007). To address this hypothesis, we examined the longitudinal interactive predictive power of both emotional intensity and emotional avoidance on GAD symptoms and worrying. We measured fear of emotions as an index of emotional avoidance (Roemer, Salters, Raffa, & Orsillo, 2005).

2. Possible longitudinal interaction of emotional intensity with problem solving

Although the chief moderator investigated in this study is emotional avoidance, we also explored the interaction of emotional intensity with appraisals about problem solving. This is based on the initiation–termination (I–T) model of worrying (Berenbaum, 2010), which considers that deficient problem solving is a major factor in the continuation of worrying. The I–T model postulates that perceived threats lead to initiation of worrying, and that a prolonged worrying comes from lack of acceptance of the possibility of threat when one feels that s/he has taken reasonable concrete actions to achieve acceptance. This model indicates that emotional avoidance and problem-solving confidence work in tandem to induce prolonged worrying. Low problem-solving confidence and emotional avoidance hinder the use of active strategies to confront problems, thus preventing one from feeling a sense of closure. For example, emotionally avoidant people may also avoid problematic situations that tend to elicit emotions and distress (e.g., interpersonal conflicts). Therefore, we explored how etiological factors related to problem solving interact with emotional intensity.

As the interaction of emotional intensity with problem-solving-related factors is at the exploratory stage, it is difficult to articulate concrete hypotheses. However, it will be helpful to focus on the aspects of appraisals about problem solving, which have been demonstrated to be related to worrying and can be conceptually tied to the I–T model. We chose the following two factors for this purpose: the responsibility to continue thinking and low problem-solving confidence. Both are measured using the Problem-Solving Related Meta-Cognitions Questionnaire (Sugiura, 2007). The responsibility to continue thinking is the belief that one needs to engage in prolonged thinking about stressful problems. Low problem-solving confidence is closely related to negative problem orientation (dysfunctional attitudes toward problem solving), which has been shown to be related to GAD symptoms (e.g., Dugas et al., 2007). The relation of both factors to worry/GAD symptoms has been shown in previous studies, as detailed in the method section. These factors are equivalent to those of the I–T model, with the responsibility to continue thinking reflecting a perseverative iterative style—another factor that delays termination of worrying in addition to inducing a reduced sense of closure—and low problem-solving confidence delaying termination of worrying by hindering the active confrontation of problematic situations, as discussed above.

3. Need for longitudinal study of GAD

Longitudinal prediction of GAD and worry has been recommended but it remains a relatively understudied research area. Hale, Klimstra, and Meeus (2010) followed adolescents for five years and found a reciprocal relationship between worrying and neuroticism, with a stronger effect from the former to the latter rather than vice versa. Because emotional intensity is closely related to neuroticism (Mennin et al., 2007), it is possible that the cross-sectional correlation of emotional intensity with worrying includes the effect of worrying on emotional intensity. Dugas, Laugesen, and Bukowski (2012) followed adolescents for 5 years and found a reciprocal relationship between intolerance of uncertainty and fear of anxiety on one hand, and worry on the other. Based on this finding, Dugas et al. recommended controlling for symptom severity in examining etiological factors. It may not be realistic to eliminate the possibility of worry affecting model variables; however, it is worth assessing whether model variables predict worrying even after controlling for prior worrying.

4. The current study

The purpose of this study is to examine whether emotional intensity can predict a later reduction in GAD symptoms. It was predicted that if fear of emotions is low, increased emotional intensity will be related to a reduction in GAD. This study also explored problem solving-related metacognitions as a possible moderator of this relationship.

5. Method

5.1. Participants and procedure

Japanese college students participated voluntarily, completing questionnaires at two time points during classes. At Time 1, they completed scales of model variables and symptoms, and symptom measures were then repeated at Time 2 (about 3 months later). Participants produced for themselves a confidential six-digit number used to match data at the two time points, while preserving anonymity. The Time 1 questionnaire was completed by 173 participants (51% women; Mean age = 19.29, SD = 1.16), while that at Time 2 was completed by 170 participants (61% women; Mean age = 19.39, SD = 0.84). We matched data for 129 participants for subsequent statistical analysis (59% women; Mean age = 19.38, SD = 0.87). The institutional ethical review board approved the study. The nature and purpose of the study were explained to participants, who were told that they could choose not to take part.

5.2. Instruments

The Emotional Intensity Scale (EIS; Bachorowski & Braaten, 1994) has 14 items for measuring positive and 16 items for measuring negative emotional intensity. Each item has a stem depicting an emotion-eliciting situation, followed by five statements indicating graded levels of emotional intensity. It yields scores for positive and negative subscales (EIS-POS and EIS-NEG), and the total scale (EIS total). The original version indicated high internal consistency and temporal stability. Total and negative scores were related to neuroticism and, unlike positive and negative emotionality, EIS-POS and EIS-NEG scores were positively correlated (Bachorowski & Braaten, 1994). The Japanese EIS indicated a high Cronbach's alpha reliability ($\alpha = 0.81$), with scores and interfactor correlations that were comparable to those in the original version, and negative and total scores that were correlated with trait anxiety, supporting its validity (Noguchi, Sato, & Yoshikawa, 2008).

The Affective Control Scale (ACS; Williams, Chambless, & Ahrens, 1997) contains 42 items that are rated on a 7-point Likert scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*, and is used to measure negative appraisals of the following four emotions: fear, depression, anger, and positive emotions. The original version has excellent internal consistency and temporal reliability and predicted fear of experimentally induced bodily sensation. The Japanese version has acceptable to good internal consistency ($\alpha = 0.69–0.91$), and the validity was indicated by correlations with neuroticism, stress reactions, and avoidant coping scales (Kanetsuki, Kanetsuki, & Oikawa, 2010).

The Problem-Solving Related Meta-Cognitions Scale (Sugiura, 2007) measures the appraisals that occur during a stressful problem-solving process, with an exclusive focus on those that lead to prolonged worry. Participants rate how often these appraisals occur while they are solving stressful problems, using a 5-point Likert scale ranging from 1 (*none*) to 5 (*very frequent*). This scale has the following two factorially derived subscales: responsibility to continue thinking (RESP), which is the belief that one needs to engage in prolonged thinking about stressful problems and is measured with 14 items (e.g., "I should continue thinking until I find better solutions" and "It is irresponsible to stop thinking"); and lack of satisfaction with the problem-solving process (LACK), which captures low problem-solving confidence using 19 items (e.g., "Things have never worked out successfully for me" and "I don't know how to solve this problem"). Sugiura (2005, 2007) reported adequate internal reliability for this instrument ($\alpha = 0.86–0.90$) and found that RESP was correlated with perfectionism and active problem solving, while LACK was correlated with other measures of poor problem-solving confidence. The incremental validity of RESP in predicting worry/GAD symptoms has been reported by comparison to the following etiological factors: metacognitive beliefs, intolerance of uncertainty, negative problem-solving orientation, cognitive avoidance, fear of emotion, and experiential avoidance (Sugiura, 2007; Sugiura & Sugiura, under review; Sugiura, Sugiura, & Tanno, 2013). Sugiura (2004, 2005) found that both RESP and LACK mediate the relationship between problem-focused coping strategies and worry.

The Generalized Anxiety Disorder Questionnaire-IV (GADQ-IV; Newman et al., 2002) measures DSM-IV GAD symptoms and can be used both to compute dimensional symptom severity and to yield dichotomous GAD status. This study used the dimensional scores. The original version instructs participants to skip questions about physical symptoms and distress, if one has not been bothered by excessive and uncontrollable worrying more days than not in the last six months. This specification was removed for the present study so that participants would rate all items, because our focus is on the broad range of GAD symptom distribution (following Roemer et al., 2009). Takebayashi, Takagaki, and Sugiura (2012)

Table 1
Descriptive statistics and internal consistencies of study variables (N = 129).

	M	SD	α
EIS–NEG	51.02	7.82	0.80
EIS–POS	48.70	7.22	0.85
EIS total	99.72	12.75	0.86
ACS	160.68	36.60	0.95
RESP	41.91	10.28	0.87
LACK	48.57	13.01	0.90
GADQ-IV Time 1	4.36	2.88	0.83
GADQ-IV Time 2	4.16	2.60	0.81
PSWQ Time 1	43.11	17.75	0.92
PSWQ Time 2	39.66	17.39	0.93

Note. EIS = Emotional Intensity Scale; ACS = Affective Control Scale; RESP = Responsibility to continue thinking; LACK = Lack of satisfaction with the problem-solving process; GADQ-IV = Generalized Anxiety Disorder Questionnaire-IV; PSWQ = Penn State Worry Questionnaire.

translated the GADQ-IV into Japanese and found the following psychometric properties, which are comparable to those of the original version: a one-factor structure, adequate internal reliability ($\omega = 0.84$), high correlation with worry and intolerance of uncertainty, and a specific relation to worrying but not to social anxiety after controlling for trait anxiety and depression. Although the GADQ-IV instructs participants to rate two items in reference to the past six months, we used the time frame of "recently" to capture changes within the 3-month interval in which this study was conducted. The high Cronbach's alphas across two occasions (0.83 and 0.81) and concurrent correlation with the PSWQ (0.75 and 0.79; $p < 0.001$) indicate acceptable preliminary psychometric properties of the present adaptation of the GADQ-IV.

The 16-item Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) has excellent psychometric properties for measuring the frequency and intensity of worry. The Japanese version (Sugiura & Tanno, 2000) has the following psychometric properties, which are comparable to the original version. It showed good internal consistency ($\alpha = 0.92$) and validity: a one-factor structure and a strong correlation with trait anxiety, forming different a factor from that of obsessive-compulsive symptoms. Because our focus in this study is on change in worrying, we used modified items of the one-week version of the scale, developed by Stöber and Bittencourt (1998), omitting one item, that is, "I've been a worrier all my life," rated on a 7-point Likert scale ranging from 0 = *never* to 6 = *almost always*. The one-week version has demonstrated high internal consistency, convergence with another worry questionnaire, and weekly improvements due to therapy (Stöber & Bittencourt, 1998). We asked participants to rate items in relation to how they had been recently, in accordance with the GADQ-IV. The high alphas of the PSWQ across two occasions (0.92 and 0.93), concurrent correlation with the GADQ-IV, and the expected zero-order concurrent correlation with model variables (Table 2, left) indicate acceptable preliminary psychometric properties of the present adaptation.

6. Results

6.1. Descriptive statistics and correlations

Descriptive statistics of the study variables are shown in Table 1. All scales exhibited good to excellent internal consistency ($\alpha = 0.80–0.95$). We first examined the correlation between Time 1 predictors and symptoms (Table 2, left).[1] EIS-NEG, EIS total, ACS,

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[1] Gender did not correlate with symptoms ($r < 0.08$; $p > 0.32$) and controlling for this variable did not change patterns of following results. Therefore, we did not include gender in the subsequent analyses.

Table 2
Zero-order (Time 1) and semi-partial (Time 2) correlations between GAD symptoms/worry and model variables.

	Time 1 symptoms[a]		Time 2 symptoms controlling for Time 1[b]	
	GADQ-IV	PSWQ	GADQ-IV	PSWQ
EIS-NEG	0.38***	0.48***	−0.03	0.06
EIS-POS	0.03	0.07	−0.05	−0.01
EIS total	0.25***	0.33***	−0.04	0.03
ACS	0.66***	0.73***	0.20*	0.30***
RESP	0.43***	0.43***	0.05	0.11
LACK	0.56***	0.57***	0.09	0.27**

$*p < 0.05$; $**p < 0.01$; $***p < 0.001$.
Note. EIS = Emotional Intensity Scale; ACS = Affective Control Scale; RESP = Responsibility to continue thinking; LACK = Lack of satisfaction with the problem-solving process; GADQ-IV = Generalized Anxiety Disorder Questionnaire-IV; PSWQ = Penn State Worry Questionnaire.
[a] $N = 173$.
[b] $N = 129$.

RESP, and LACK scores were all positively related to both GAD symptoms and worrying, consistent with previous cross-sectional results (e.g., Mennin et al., 2007; Sugiura, 2007).

We also computed semi-partial correlations between residualized Time 2 symptoms, controlling for Time 1 scores and predictors (Table 2, right). ACS scores were related to both enhanced GAD symptoms and worrying, while LACK scores were related increased worrying. Other significant semipartial correlations were not found. None of the emotional intensity indices indicated semipartial correlations with residualized Time 2 symptoms; therefore, their effects on later symptoms, if any, are not main effects.

6.2. Interactive effect of emotional intensity and cognitive factors on GAD/Worry

To examine the longitudinal interactive predictive power of the model variables, we conducted series of hierarchical regression analyses, where scores on the PSWQ and GADQ-IV served as dependent variables. Each regression includes one of the emotional intensity indices (EIS-POS/EIS-NEG/EIS total) and one of three moderators (ACS/LACK/RESP). Variables are mean centered to enhance interpretation. A variance inflation factor greater than 2.28 was not observed, suggesting no multicollinearity. Predictors were entered in a hierarchical manner, whereby Time 1 symptoms were entered in step 1, main effect of emotional intensity and moderator in step 2, and their interaction in step 3.

When predicting GADQ-IV scores, 56% of the variance in Time 2 GADQ-IV scores was predicted by Time 1 GADQ-IV scores. Significant main/interaction effects were as follows: (a) the main effects of EIS-NEG and ACS explained an additional 4% of the variance ($p < 0.01$) and their interaction explained a further 2% ($p < 0.05$). Main effects were derived from the positive relationship between ACS scores and GAD symptoms (B = 0.02; $p < 0.01$). (b) The main effects of EIS-NEG and LACK were not significant ($\Delta R^2 < 0.01$; $p = 0.35$) and their interaction explained a further 1% of the variance ($p < 0.05$). (c) The main effects of EIS total and ACS an explained additional 5% of the variance ($p < 0.01$), while their interaction did not approach significance ($\Delta R^2 < 0.05$; $p = 0.21$). Main effects were derived from the positive relationship between ACS and GAD symptoms (B = 0.02; $p < 0.01$). (d) The main effects of EIS total and RESP were not significant ($\Delta R^2 < 0.01$; $p = 0.71$) and their interaction explained a further 1% of the variance ($p < 0.05$).

Therefore, three interactions emerged. Simple slopes for the three significant interactions in predicting GAD symptoms were probed using the method of Preacher, Curran, and Bauer (2006).

Fig. 1 depicts the effects of emotional intensity on GAD symptoms where moderators are ±1.5 SD from means. (a) When ACS scores were low (−1.5 SD), EIS-NEG reduced GAD symptoms (B = −0.09; $p < 0.01$), while when ACS scores were high (+1.5 SD), EIS-NEG had no effect on GAD symptoms (B = 0.01; $p = 0.67$). (b) When LACK scores were low (−1.5 SD), EIS-NEG tended to reduce GAD symptoms (B = −0.06; $p < 0.10$), while when LACK scores were high
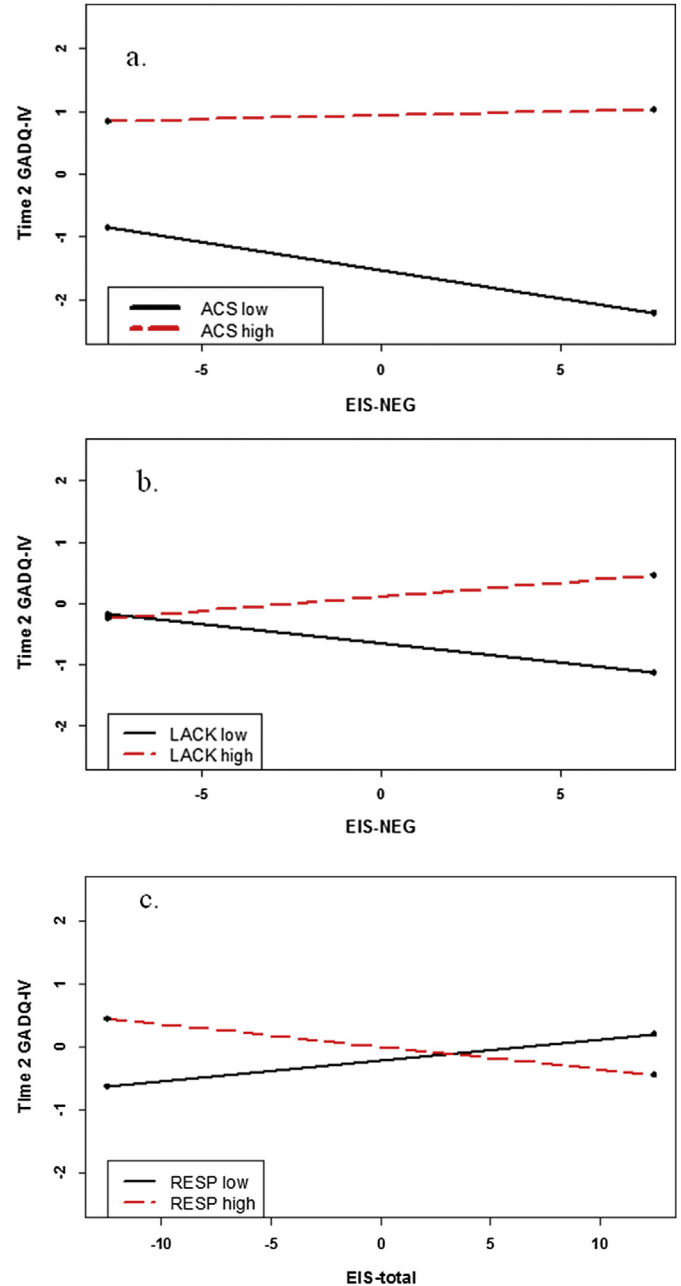

Fig. 1. The effect of emotional intensity on later GAD symptoms, as moderated by emotional avoidance/problem-solving appraisal. Variables are mean-centered. (a) The effect of negative emotional intensity on later GAD symptoms as moderated by fear of emotions. (b) The effect of negative emotional intensity on later GAD symptoms as moderated by negative appraisals about problem solving. (c) The effect of total emotional intensity on later GAD symptoms moderated by responsibility to continue thinking. EIS = Emotional Intensity Scale; ACS = Affective Control Scale; RESP = Responsibility to continue thinking; LACK = Lack of satisfaction with the problem-solving process; GADQ-IV = Generalized Anxiety Disorder Questionnaire-IV.

($+1.5$ SD), EIS-NEG had no effect on GAD symptoms (B $= 0.05$; $p = 0.15$). (c) When RESP scores were high ($+1.5$ SD), EIS total scores tended to reduce GAD symptoms (B $= -.04$; $p < 0.10$), while under low RESP scores (-1.5 SD) these tended to increase GAD symptoms (B $= 0.03$; $p < 0.10$).

When predicting PSWQ scores, 57% of Time 2 PSWQ scores were predicted by Time 1 PSWQ scores. No significant interaction emerged. In regressions involving ACS or LACK scores, significant main effects were observed (ACS: $\Delta R^2 > 0.09$; $p < 0.01$; LACK: $\Delta R^2 > 0.07$; $p < 0.01$), driven by positive effects of ACS (B $= 0.09-.12$; $p < 0.001$) or LACK scores (B $= 0.23-.24$; $p < 0.01$) on worrying.

7. Discussion

We found that there was an interaction between negative emotional intensity and fear of emotions in relation to GAD symptoms. Specifically, when fear of emotions was low, negative emotional intensity reduced GAD symptoms. Moreover, when problem-solving confidence was high, negative emotional intensity tended to reduce GAD symptoms. Finally, total emotional intensity interacted with responsibility; contrary to our expectation, under high responsibility emotional intensity tended to reduce GAD symptoms, while under low responsibility it tended to enhance GAD symptoms. Interactions found in this study suggest that a rationale focused on fear of emotions, and possibly on problem-orientation training, may enhance the effect of emotional exposure.

Previous studies found that emotional intensity is a strong positive predictor of GAD symptoms/worrying (Mennin et al., 2007, 2009). In fact, we found significant positive zero-order correlations between EIS-NEG/EIS total and GAD symptoms/worry at Time 1 ($r = 0.25-0.48$; $p < 0.0001$). Contrary to these cross-sectional relationships, negative emotional intensity reduced worrying 3 months later, at Time 2, when combined with reduced fear of anxiety and reduced negative appraisals about problem solving (trend). Mennin et al. (2009) argued that emotional intensity itself is not pathological. In the present longitudinal design, the resultant relationship indicates that experiencing intense emotions leads to a subsequent reduction in GAD symptoms under certain circumstances.

The present results can be understood in light of the notion that emotional experiences lead to therapeutic change (Pascual-Leone & Greenberg, 2007). Foa and Kozak (1986) considered emotional reactivity to feared objects as a marker of emotional processing. Newman and Llera (2011) found a lack of augmentation of CBT by emotion processing techniques in a randomized controlled trial and questioned the emphasis on interpersonal context and phenomenological experience of current techniques for enhancing emotional processing, further suggesting the need to explore conditions under which emotional processing is successful. Newman and Llera (2011) recommended the more focused use of exposure to sudden increases in emotion, based on their review (Newman, Llera, Erickson, Przeworski, & Castonguay, 2013) and empirical evidence (Llera & Newman, 2014) indicating that worry does not suppress emotions but functions to avoid the impact of a sudden increase in emotions by maintaining a sustained negative emotional state.

This study may be considered to indicate further conditions conducive to successful use of emotional experiences, specifically, reduced fear of emotions and enhanced confidence in problem solving. The former is understandable as fear of emotions may hinder fully experiencing those emotions, or enhance avoidance of emotions, while the latter suggests that those with high confidence in problem solving will confront emotional experiences with investigative attitudes. Negative appraisals of problem solving may

be partly related to difficulty with utilizing emotions in problem solving. In line with this, Berenbaum (2010) expected a positive relationship between emotional avoidance and a reduced tendency to actively solve problems. From a life-span development perspective, Lawton (2001) argued that emotions are intrusive for immature people, while mature people consider emotions to be informative. Although direct translation may be overstating, it is possible that those with negative problem-solving attitudes cannot benefit (e.g., learn something) from intense emotions. However, results pertaining to problem-solving confidence need further replication because a simple slopes analysis showed only an indication of a trend.

Moreover, the nature of emotional intensity measured here suggests that there are further conditions that promote successful emotional processing. Of studies in which positive relationships were found between emotional intensity and GAD symptoms, Mennin et al. (2005, 2007) used the Berkeley Expressivity Questionnaire (BEQ; Gross & John, 1997), which emphasizes intense expression, and then, in a later study (Mennin et al., 2009), used the Affect Intensity Measure (AIM; Larsen & Diener, 1987). Although the AIM was first conceived of as unidimensional index of intensity, later studies found there were separate factors for reactivity (strength of response to specific situations) and intensity (strength of emotions once experienced), especially in regard to negative emotions (Bryant, Yarnold, & Grimm, 1996). As EIS items are all situation-specific, this scale may reflect emotional reactivity, and situation-specific emotional reactions may represent differentiated emotions. Emotion regulation therapy for GAD seeks to increase differentiated emotions via thematic experiential exposure, in which patients are asked to engage in various emotions and explore the appraisals and beliefs about them that drive emotional avoidance. It aims to integrate information from multiple sources (emotional, contextual, and cognitive) to enable one to respond to situations and events in accordance with one's personal goals and values (Mennin, 2006). The importance of situational-specific items in examining the negative relationship between emotional intensity and GAD symptoms is consistent with the emphasis in emotion regulation therapy on integrating information from multiple sources, including context. However, capturing the nuanced relation between emotional intensity and psychopathology will require systematic investigation of person, situation, strategy, and goal dimensions (Aldao, 2013). Furthermore, self-reports of emotional intensity in response to specific situations may require certain level of awareness and clarity about emotions and contexts. Therefore, it might have led to the detection of a negative relation to GAD symptoms. Moreover, although the orthogonal nature of positive and negative emotionality is well-documented (Watson, Clark, & Tellegen, 1988), the EIS-POS and EIS-NEG subscales indicated substantial positive correlations with the present data ($r = 0.43$, $p < 0.001$). Therefore, EIS-NEG may represent the ability to experience both positive and negative emotions, rather than an inflexible adherence to negative emotions. Focusing on a multidimensional measure of emotional intensity (reactivity, intensity, expressivity, and valence) may further elucidate the distinction between adaptive and maladaptive sides of emotional intensity. Dividing emotional valence into finer dimensions will also be fruitful. McFatter (1998) found that there were differential personality correlates of anger-vs. non-anger-related negative emotional intensity.

An unexpected finding was that, there was a trend toward EIS total scores reducing GAD symptoms when responsibility to continue thinking was high. Because RESP is thought to prolong worrisome thinking, it was predicted to interfere with emotional processing. One speculation is that the present results are driven by positive emotional intensity. However, EIS-POS presented a trend

toward interaction with RESP ($\Delta R^2 = 0.01$; $p < 0.10$), which is almost the same magnitude as that for EIS-NEG ($\Delta R^2 = 0.01$; $p < 0.10$), with similar configurations of simple slopes. Another possibility is that the present results stem from the shared variance between RESP and problem-focused coping (Sugiura, 2005). With regard to active problem-focused attitudes, strong emotions can be adaptive; however, the positive correlation between LACK and RESP ($r = 0.49$; $p < 0.0001$) and previous findings that LACK mediated the effect of the RESP on worrying (Sugiura, 2004) indicate that RESP is also related to the negative orientation toward problem solving, thereby making this interpretation unlikely.[2] Finally, high responsibility may lead to persistent confrontation to intense emotions. A treatment study reported that comorbid obsessive-compulsive personality disorder enhanced treatment of obsessive-compulsive disorder in the form of increased persistence in exposure homework (Gordon, 2009). Again, this needs further replication because a simple slopes analysis showed only an indication of a trend.

7.1. Limitations and future directions

The first limitation of this study is the exclusive reliance on a nonclinical population. However, continuity in the distribution of worry has been empirically demonstrated (Olatunji, Broman-Fulks, Bergman, Green, & Zlomke, 2010). Second, we relied on self-report measures. As, Kerns, Mennin, Farach, and Nocera (2014) demonstrated, assessing reduced emotion regulation ability among those with GAD using performance and behavioral measures will be informative. Third, a more differentiated measure of emotional intensity is required, as discussed above. Fourth, given the chronic course of GAD and worrying, it is important to examine longer time intervals. Fifth, although significant interactions were found with regard to problem-solving-related appraisals, a simple slopes analysis at ± 1.5 *SD* from the means of the moderators indicated that we should be cautious in interpreting these results. Sixth, although this study used recent versions of the PSWQ/GADQ-IV to capture changes, using new methods may have been a weakness due to lack of compilation of validity evidence. In addition, PSWQ scores were relatively low. However, our participants' GADQ-IV scores (see Table 1) were at the same level reported in Takebayashi et al. (2012; $M = 4.12$ $SD = 2.63$). In addition, the use of items based on widely used measures will lend some confidence in the present results. Nonetheless, future studies might use a more focused time frame than "recently." Seventh, the relationships among the present set of predictors and other psychopathologies deserve consideration because repetitive thoughts are considered to be transdiagnostic etiological factors (Ehring & Watkins, 2008). Finally, future studies may try a prediction of symptoms over a longer period of time.

Conflict of interest declaration

The authors declare that there are no known conflicts of interest.

Acknowledgments

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[2] This does not mean that perseverance itself is adaptive or maladaptive. The adaptiveness of perseverative effort may depend on other factors, for example, the relative importance of efficiency/efficacy (cf. Berggren & Derakshan, 2013).

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