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ORIGINAL PAPER

The indirect effects of emotion regulation on the association between attachment style, depression, and meaning made among undergraduates who experienced stressful events

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Abstract
Undergraduates frequently report exposure to stressful life events which may negatively impact mental health. The current study examined associations among attachment style, depression, and meaning made, and tested both direct effects and indirect effects through emotion regulation difficulties. Undergraduates ($N=336$) who reported having experienced stressful and/or potentially traumatic events completed measures through an online survey. More than half of participants (64%) were female, with a mean age of 19.26 years. In both models, higher attachment anxiety and higher attachment avoidance were significantly associated with greater difficulties with accessing emotion regulation strategies, which in turn were related to higher depression symptom severity and lower meaning made. Lack of emotional awareness also partially explained the associations between attachment avoidance and outcomes in both models. Difficulties in engaging in goal-directed behavior partially explained the associations between attachment anxiety and meaning made, but not depression symptom severity. Our results suggest certain emotion regulation strategies may be key mechanisms through which individuals with high attachment anxiety or avoidance may reduce the potential negative mental health impact that stressful life events may have.

Keywords Emotion regulation · Meaning made · Depression severity · Attachment style

Introduction

Exposure to stressful life events among college students is high, with 85–99% of students reporting having experienced at least one stressful event in their lifetimes (Anders et al. 2012a, b; Frazier et al. 2009). Stressful life events may include traumatic experiences as defined by the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5; American Psychiatric Association 2013) criteria for posttraumatic stress disorder, as well as other major life events that may contribute to psychological distress (Anders et al. 2012a, b; Phillips et al. 2015). High rates of exposure to stressful life events can negatively impact mental and physical health, and predict lower college grade point averages among undergraduates (Anders et al. 2012a, b). Specifically, the experience of stressful life events has been shown to increase college students' depression symptom severity, which, in turn, negatively affects academic performance (Andrews and Wilding 2004). Strong evidence exists that stressful life events precede the onset of depressive symptoms (Hammen 2005; Phillips et al. 2015). Higher depression severity is associated with reliance on maladaptive coping strategies when faced with high perceived stress (Kamimura et al. 2015), which may increase the risk of poorer mental health outcomes (e.g., Linden and Jurdi-Hage 2017).

When attempting to cope with stressful life events, individuals engage in a meaning making process. According to Park's (2010) meaning making model, this process involves reconciling discrepancies between overarching beliefs, goals, and sense of purpose or meaning in life (i.e., global meaning) with beliefs about why the stressful event occurred, what it means for the future, and to what extent it is threatening or controllable (i.e., appraised meaning). For example, an individual's global beliefs prior to a severe stressor may be that "good things happen to good people

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and bad things only happen to bad people," also referred to as the just world myth. After a severely stressful event, the individual may question whether they are a good person because of the belief that bad things only happen to bad people (i.e., appraised meaning). The individual would then move through a process of making meaning, resolving these discrepancies between global and appraised meanings, and coming to a new belief such as, "Sometimes bad things happen to good people." As a result of the meaning making process, meaning made includes making sense of the stressful experience, accepting what happened, and changing global goals based on newly obtained information, among others (Park 2010). Greater meaning made following a specific traumatic or stressful event has been associated with lower psychopathology (Currier et al. 2011, 2013) and lower suicide risk (Holland et al. 2014). The fact that the experience of stressful life events can result in both negative (depression) and positive (meaning made) outcomes emphasizes the importance of evaluating specific coping strategies in order to determine which mental health outcome they are associated with.

One coping strategy that has previously been identified as being adaptive in times of distress is emotion regulation (Gratz and Roemer 2004). The attempt to regulate one's emotions is an active process, which involves appropriately labeling and accepting emotions, controlling impulses in the presence of negative emotions, and adjusting emotional responses to fit the situation and maintain goal-directed behavior (Gratz and Roemer 2004). Emotion regulation difficulties have been implicated in psychopathology, particularly with depression (see Joormann and Stanton 2016 for review). Specifically, depressed individuals are likely to report greater reliance on maladaptive emotion regulation strategies, such as suppression or rumination (Joormann and Stanton 2016). In turn, these maladaptive emotion regulation strategies, and even a perceived lack of emotion regulation strategies, were found to be associated with depressive symptoms (Aldao et al. 2010; Marganska et al. 2013). Difficulty with emotion regulation has been shown to partially mediate the association between stressful life events and depressive symptoms, such that poor emotion regulation can partially explain increases in depression after exposure to stressful experiences (Abravanel and Sinha 2015). One limitation of these studies is their evaluation of poor emotion regulation without examining specific emotion regulation strategies. It is important to examine specific emotion regulation strategies in order to be able to determine their impact on mental health outcomes and the meaning making process.

Much research has focused on the influence of attachment style in the context of stressful life experiences (e.g., McCarthy et al. 2006). For example, individuals who have high attachment anxiety tend to display hyperactivating strategies in response to threat or stress, seeking out support despite their conviction that they will be rejected or abandoned (Mikulincer and Shaver 2013). On the other hand, individuals with high attachment avoidance usually adopt deactivating strategies and prefer to handle stressful situations alone (Mikulincer and Shaver 2013). Securely attached individuals tend to expect that others will be available in times of distress, feel comfort in close relationships, and tend to cope with stressors constructively (Mikulincer and Shaver 2016).

Secure attachment has been shown to be associated with fewer difficulties with emotion regulation, whereas individuals with insecure attachment patterns, such as anxious or avoidant attachment, tend to encounter difficulties with emotion regulation (Mikulincer and Shaver 2016; Morel and Papouchis 2015; Pepping et al. 2013). Research has demonstrated that both attachment anxiety and avoidance are associated with difficulties in emotional awareness (Morel and Papouchis 2015). Further, in prior research, attachment anxiety predicted lack of appropriate strategies for emotion regulation and poor impulse control, while avoidant attachment was correlated with lack of emotional clarity and nonacceptance of negative emotions (Morel and Papouchis 2015). Given their association with cognitions, emotions, and behaviors, attachment styles can have both positive and negative effects on mental health (Mikulincer and Shaver 2016). Among college students, high attachment anxiety and high attachment avoidance may compromise the ability to make satisfying social connections and contribute to depression (Wei et al. 2005).

Emotion regulation as mediator between attachment and depression

Researchers have begun to investigate the mediating role of emotion regulation in the link between attachment style and depression. Studies have shown that secure attachment styles are associated with fewer difficulties with emotion regulation (Marganska et al. 2013). Moreover, evidence suggests that use of emotion-focused strategies mediates the link between anxious attachment and general symptoms of psychopathology, but not the association between avoidant attachment and psychopathology (Pascuzzo et al. 2015). For individuals whose attachment style is characterized by both high anxiety and high avoidance, difficulties with accessing emotion regulation strategies fully mediated the link between attachment and depression (Marganska et al. 2013). Systematic review supports the different associations between psychopathology and anxious and avoidant attachment, with strong evidence that difficulties with emotion regulation partially explain the association between anxious attachment and depression (Malik et al. 2015). However, evidence supporting difficulties with emotion regulation as a link between avoidant attachment and depression was mixed

(Malik et al. 2015). Because differences exist in how anxious and avoidant attachment relate to depression, our intention was to examine whether specific emotion regulation strategies at least partially explain the association between each insecure attachment style and depression in a stressor-exposed sample.

Emotion regulation as mediator between attachment and meaning made

Unlike the well-researched associations between attachment, emotion regulation, and depression, the associations between attachment, emotion regulation, and meaning made have not been explicitly studied. Using an aspect of global meaning, one's sense of meaning in life (Park 2010), some research has suggested that securely attached individuals demonstrate greater sense of meaning in life than individuals with insecure attachment styles (Bodner et al. 2014). In turn, while attachment anxiety has been found to negatively predict a sense of meaning in life, attachment avoidance has not (Lopez et al. 2015). In other work (Owens 2016), high levels of meaning made moderated the impact of attachment anxiety on posttraumatic symptom severity, but had no significant moderating effect on attachment avoidance. To our knowledge, no research to date has yet examined whether the use of emotion regulation strategies is associated with individuals making meaning from stressful life events.

The present study

Given the gaps in the literature, particularly in regard to meaning made, the first aim of the current study was to examine how attachment anxiety and attachment avoidance relate to depression as well as meaning made among individuals who reported having experienced stressful or potentially traumatic events. We hypothesized that high attachment anxiety and attachment avoidance would be positively associated with higher depression symptom severity and negatively related to meaning made. The second aim was to investigate whether emotion regulation difficulties explain the associations between attachment style and depression and the associations between attachment style and meaning made. We hypothesized that difficulties with emotion regulation would at least partially explain the relations between attachment style and both depression symptom severity and meaning made. Thus, higher attachment anxiety and avoidance would be associated with greater emotion regulation difficulties, and, in turn, higher levels of depression symptom severity and lower meaning made.

Method

Participants and procedure

Participants were 336 undergraduate psychology majors recruited through the department of psychology research pool at a large southeastern university who reported experiencing a stressful event. Mean age of the sample was 19.26 years ($SD = 3.70$), with over half of participants (64%) being female. Most participants self-identified as Caucasian (82%), followed by 7% African American, 4% Asian American, 1% American Indian, and 5% Hispanic/Latina/Latino ethnicity, with 4% indicating they were multiracial. Regarding year in school, 71% were first year students, 17% second year, 7% third year, 4% fourth year, and 2% fifth year. Many participants (60%) were single, with another 35% dating a partner but not living with them, 3% living with a partner, 2% married, and less than 1% divorced. Participants also were asked to report their most stressful or traumatic event. The most commonly identified stressful event was the sudden death of close family or friend (28%), followed by "some other sudden event" that made them feel "scared, helpless, or horrified" (21%); severe transportation accident (12%); childhood sexual abuse (7%); seeing someone die suddenly or get badly injured or killed (6%); sudden abandonment by a spouse/partner, parent, or family (5%); natural disaster (4%); rape or sexual assault (3%); childhood physical abuse (3%); bad accident at work or home (3%); and 2% or less each reporting being attacked with a weapon, sudden loss of home or possessions, adult physical assault, and combat as their most stressful event. The stressful events occurred an average of 4.93 years ago ($SD = 4.43$).

As part of the university psychology research pool process, potential participants read a brief description about the study and participation requirements, which included having a past severely stressful and/or traumatic event. Interested individuals then clicked a link to the online survey where they first were provided with informed consent information. Participants were directed to the survey after consenting to participate. All participants received 1 h of experimental course credit for completing the survey. Procedures were approved by the university Institutional Review Board.

Measures

Trauma history screen (THS; Carlson et al. 2011)

The THS is a 13-item scale that determines whether an individual has experienced any potentially traumatic

events. Some items on the THS would be considered stressful rather than traumatic under DSM-5 (American Psychiatric Association 2013); thus, this measure was used to ascertain severely stressful events experienced. Participants are asked to indicate whether a particular event occurred (Yes or No) and the number of times the event happened. Participants were also asked to rate which event was most traumatic and how long ago the stressful event occurred.

Integration of Stressful Life Experiences Scale (ISLES; Holland et al. 2010)

The ISLES is a 16-item scale that assesses the meaning an individual has made after experiencing a stressful life event. Items are rated on a 5-point scale from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*) and total scores range from 16 to 80, with higher scores reflecting greater meaning made. Participants were asked to respond to items while thinking about the event they identified as most stressful on the THS. Internal consistency reliability for the total scale was .92. Convergent validity has been supported by high correlations with similar measures of meaning and correlations in expected directions with measures of distress (Holland et al. 2010). Cronbach's alpha for the total score in the current study was .89.

Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer 2004)

The DERS is a 36-item measure designed to assess difficulties with emotion regulation. Items are rated on a 5-point scale from 1 (*Almost never*) to 5 (*Almost always*). Six subscales (Nonacceptance, Goals, Impulse, Awareness, Strategies, and Clarity) are included on the scale, with higher scores indicating greater difficulties with emotion regulation. Example items from each of the subscales are "When I'm upset, I become embarrassed for feeling that way" (Nonacceptance); "When I'm upset, I have difficulty getting work done" (Goals); "When I'm upset, I become out of control" (Impulse); "When I'm upset, I acknowledge my emotions" (Awareness); "When I'm upset, I believe that there is nothing I can do to make myself feel better" (Strategies); "I am confused about how I feel" (Clarity). Internal consistency reliability for the subscales ranged from .80 to .89 for subscales and was .93 for the total scale (Gratz and Roemer 2004). Construct and predictive validity of the DERS also have been supported (Gratz and Roemer 2004). Factor analysis of the DERS (Fowler et al. 2014) suggests that use of subscale scores is preferred over the total score. Cronbach's alpha for subscales in the current study ranged from .81 (Awareness) to .91 (Nonacceptance).

Experiences in Close Relationships Scale-Short form (ECR-S; Wei et al. 2007)

The ECR-S is a brief, 12-item assessment of adult attachment styles derived from the original ECR (Brennan et al. 1998). Items are rated on a 7-point scale, from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). The ECRS consists of two subscales, attachment anxiety and attachment avoidance. Higher scores indicate greater attachment anxiety and attachment avoidance The ECRS has good internal consistency, with Cronbach's alphas of .78 (Anxiety) and .84 (Avoidance), and construct validity has been supported by correlations in expected directions with similar constructs (Wei et al. 2007). In the current study, Cronbach's alphas were .71 (Anxiety) and .84 (Avoidance).

Depression subscale of the Depression, Anxiety, Stress Scale-21 (DASS-21; Lovibond and Lovibond 1995)

The Depression subscale of the DASS-21 consists of seven items, which measure the respondent's level of depression over the past week. Respondents rate how much statements applied to them on a 4-point scale ranging from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*). Since the DASS-21 is a shortened version of the original DASS-42, the authors recommend multiplying total scores by 2 so they can be compared to the original DASS-42 (Lovibond and Lovibond 1995). Thus, total scores range from 0 to 42, with higher scores suggesting greater depression severity. Prior research (Antony et al. 1998) demonstrated good internal consistency and concurrent validity of the DASS-21. Cronbach's alpha for the DASS Depression scale in the current study was .91.

Results

Data analysis was conducted using SPSS software version 24.0 (IBM Corp. 2016). Independent variables were examined for their appropriateness for multivariate analysis. Skewness, kurtosis, and multicollinearity for all variables were in appropriate ranges. Means, standard deviations, and correlations for all variables of interest are shown in Table 1. In correlational analyses, higher attachment anxiety and avoidance were associated with higher depression and lower meaning made ($p < .001$). Attachment anxiety was positively associated with all emotion regulation subscales ($p < .05$), while attachment avoidance was positively associated ($p < .05$ or greater) with all but difficulties in engaging in goal-directed behavior (goals). In addition, all emotion regulation subscales were positively associated with depression and negatively associated with meaning made ($p < .001$).

Table 1 Means, standard deviations, and correlations among study variables

Variable	M	*SD*	1	2	3	4	5	6	7	8	9
Depression (DASS)	8.41	9.07	–								
Meaning made (ISLES)	57.36	12.29	−.36***	–							
Attachment anxiety (ECRS)	23.72	6.96	.46***	−.36***	–						
Attachment avoidance (ECRS)	18.91	7.79	.21***	−.32***	.23***	–					
Goals (DERS)	14.88	4.93	.34***	−.34***	.37***	.10	–				
Impulse (DERS)	12.02	5.00	.41***	−.37***	.41***	.33***	.50***	–			
Strategies (DERS)	18.11	7.17	.64***	−.44***	.47***	.35***	.54***	.68***	–		
Clarity (DERS)	12.62	4.25	.45***	−.38***	.38***	.35***	.35***	.48***	.52***	–	
Nonacceptance (DERS)	14.79	6.51	.45***	−.32***	.30***	.27***	.37***	.45***	.61***	.38***	–
Awareness (DERS)	16.31	4.95	.27***	−.30***	.11*	.35***	.05	.15**	.18**	.47***	.13*

To investigate the two proposed multiple indirect effects models, we used the MEDIATE SPSS macro (Hayes and Preacher 2014). To test the significance of our analyses, we performed bootstrapping analyses with 10,000 bootstrapping resamples to obtain 95% bias-corrected confidence intervals (CIs) for indirect effects (Preacher and Hayes 2008; Shrout and Bolger 2002). Indirect effects are considered significant if the CI does not contain zero (Preacher and Hayes 2008). We examined time since trauma, gender, type of trauma (interpersonal versus non-interpersonal) as a potential covariate that we suspected might impact the outcome variables. Time since trauma was not significantly correlated with the outcome variables and was therefore not included in the analyses. Gender (male = 0, female = 1) was significantly associated with meaning made and type of trauma (non-interpersonal = 0, interpersonal = 1) was associated with both depression severity and meaning made. In addition, depression severity and meaning made were significantly correlated with each other. Therefore, variables with a significant association with outcomes were entered as covariates in respective models.

In our model predicting depression (Fig. 1), trauma type and meaning made were entered as control variables. Meaning made was significantly ($p < .05$) and negatively associated with each of the six emotion regulation variables (goals, $B = -.24$; impulse control, $B = -.20$; strategies, $B = -.26$; clarity, $B = -.21$; Nonacceptance, $B = -.20$; Awareness, $B = -.21$) but trauma type was not. Trauma type and meaning made were not significantly correlated with depression severity. There were three significant indirect effects. First, there was a significant indirect effect between attachment anxiety and depression through limited access to emotion regulation strategies (strategies; mean indirect effect [unstandardized] = .28, SE = .06, 95% CI [.18, .40], β = .22). Second, a significant indirect effect was found between attachment avoidance and depression through strategies (mean indirect effect [unstandardized] = .15, SE = .04, 95% CI [.08, .23], β = .13). Third, there was a significant indirect effect between attachment avoidance and depression through lack of emotional awareness (Awareness; mean indirect effect [unstandardized] = .06, SE = .02, 95% CI [.02, .11], β = .06). No other significant indirect effects were found for remaining emotion regulation skills. The variables explained 47% of the variance in depression severity.

In our mediation model predicting meaning made (Fig. 2), gender, trauma type, and depression severity were entered as control variables. Depression severity was significantly ($p < .05$) and positively associated with each of the six emotion regulation variables (goals, $B = .22$; impulse control, $B = .25$; strategies, $B = .50$; clarity, $B = .32$; Nonacceptance, $B = .37$; Awareness, $B = .24$) but gender and trauma type were not. Gender was significantly and negatively correlated with meaning made ($B = -.16$), but trauma type and depression severity were not. There were two significant indirect effects. First, a significant indirect effect was found between attachment anxiety and meaning made through difficulties in engaging in goal-directed behavior [goals; mean indirect effect (unstandardized) = −.08, SE = .04, 95% CI [−.16, −.02], β = −.05]. There was also a significant indirect effect between attachment avoidance and meaning made through lack of emotional awareness [awareness; mean indirect effect (unstandardized) = −.10, SE = .04, 95% CI [−.19, −.03], β = −.06]. No other indirect effects were found for remaining emotion regulation strategies. The variables explained 30% of the variance in meaning made.

Discussion

The current study examined two models to determine the associations between attachment style and depression, and attachment style and meaning made, respectively. Based on the existing literature, we hypothesized that difficulties with emotion regulation would explain, at least in part, the associations between the aforementioned variables in each model. The study findings partially supported our

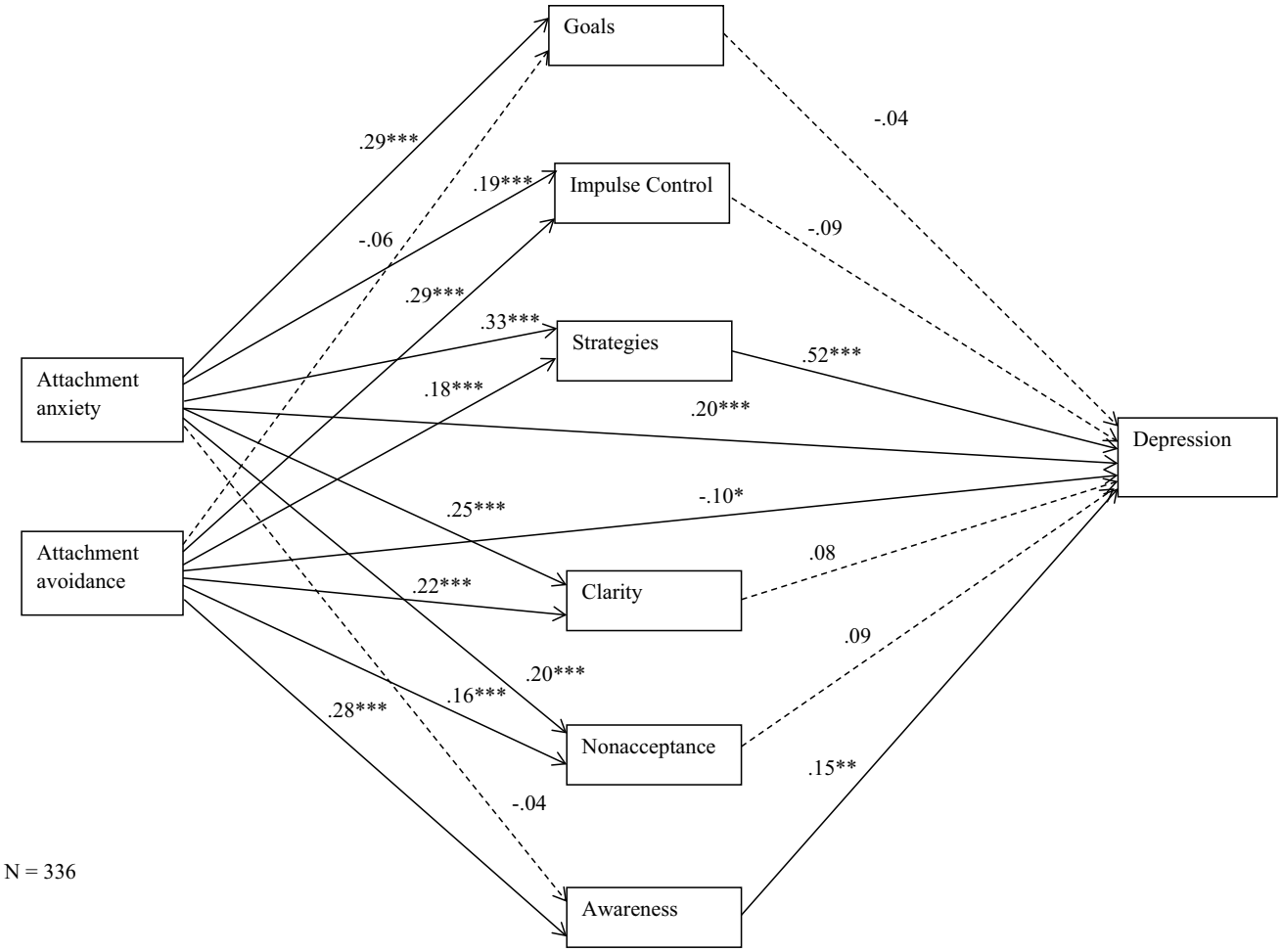

Fig. 1 Path model of direct and indirect relations of variables of interest predicting depression symptom severity. Trauma type and meaning made were entered as control variables but are not shown in the figure for ease of presentation. Values reflect standardized coefficients. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

hypotheses regarding depression. Specifically, the results support the notion that higher attachment anxiety and avoidance are strongly associated with depressive symptoms, and that a lack of effective emotion regulation strategies, such as a difficulties attending to and recognizing emotions, may be a factor that partially explains this association (Malik et al. 2015). Our findings also suggest that individuals with high attachment anxiety and avoidance may be especially prone to believe that once upset, they can do little to regulate their emotions (i.e., difficulties with accessing emotion regulation strategies). This way of thinking may increase individuals' risks for developing or maintaining depressive symptoms (Malik et al. 2015; Marganska et al. 2013). Based on our results, it can be hypothesized that adaptive emotion regulation strategies, which increase attention to and acknowledgment of emotions, may play a protective role in the development of depression following stressful life events. Longitudinal research utilizing an experimental design is needed to determine whether preventive interventions that teach adaptive emotion regulation strategies following stressful life events may reduce the risk for developing depressive symptoms among individuals with high attachment anxiety and avoidance.

Regarding meaning made, a unique finding was that difficulties with engaging in goal-directed behavior partially explained the association between attachment anxiety and meaning made. Our results suggest that a lack of effective emotion regulation strategies is not just associated with negative mental health outcomes, such as depression, but also may interfere with positive outcomes such as successfully making meaning after stressful life events. Our findings are consistent with Park's (2010) meaning making model and support the importance of goal-directed behavior in the successful resolution of distress following a stressful life event. Thus, when working with individuals who have high attachment anxiety, it may be helpful to assist them engage

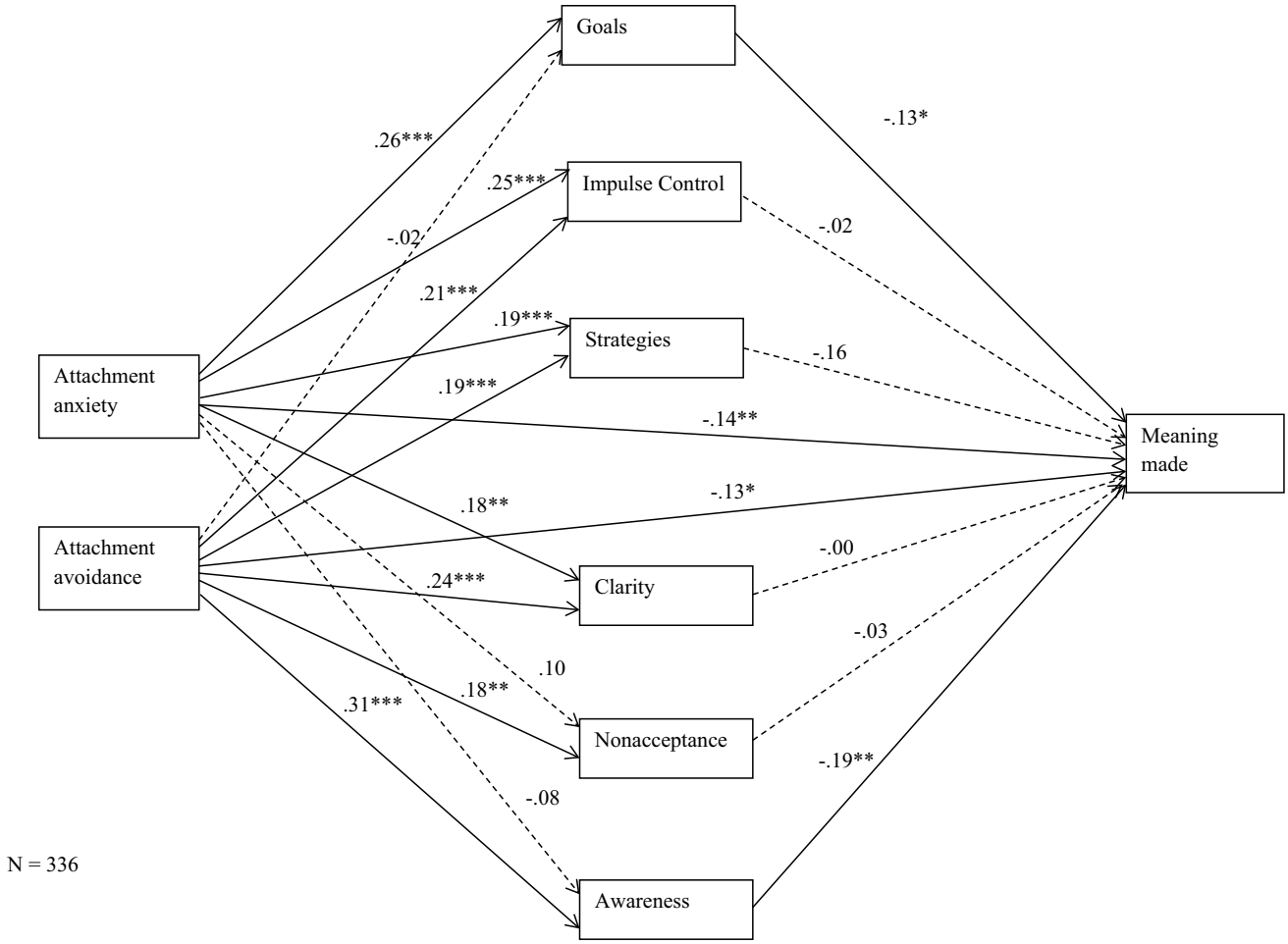

Fig. 2 Path model of direct and indirect relations of variables of interest predicting meaning made. Gender, trauma type, and depression severity were entered as control variables but are not shown in the figure for ease of presentation. Values reflect standardized coefficients. *$p < .05$, **$p < .01$, ***$p < .001$

in goal-directed behavior, as this may positively affect their ability to make meaning of a stressful life event and successfully integrate the event into their existing belief systems. Our results extend prior literature by examining associations between attachment, emotion regulation, and outcomes of depression and meaning made in a sample experiencing stressful events.

Contrary to our hypotheses, but as to be expected, not all emotion regulation strategies significantly affected associations between attachment anxiety and avoidance, and outcomes of depression symptom severity and meaning made. Other emotion regulation strategies, such as nonacceptance of emotional responses, impulse control difficulties, and lack of emotional clarity may not be as central to either depression or meaning making with our mixed stressor sample. On the other hand, limited access to emotion regulation strategies and difficulties attending to and acknowledging emotions may be especially critical components with these outcomes. For example, difficulties with impulse control, which encompass "losing control over behaviors" and "becoming out of control" are associated with high attachment anxiety and avoidance, but do not appear to affect depression severity as strongly as beliefs that one will end up feeling depressed and that one "will remain that way for a long time" (limited access to emotion regulation strategies; Gratz and Roemer 2004, p. 48). In line with existing research on the role of cognitions and emotional awareness in depression (e.g., Kranzler et al. 2016), our findings suggest that negative cognitions about one's ability to manage distress and low emotional awareness appear to affect depression severity and meaning made more strongly than other forms of emotion dysregulation. Interventions that focus on building emotion regulation skills (e.g., Berking et al. 2008) may be especially critical for individuals experiencing stressful life events.

Limitations and future directions for research

Several limitations of the current study should be considered. Our sample consisted of undergraduates who received course credit for their participation. Thus, we cannot determine potential differences that may exist of the variables of interest between those who decided to participate and those who did not. Future research would benefit from including more diverse samples in terms of age, as well as race and ethnicity. This study was a cross-sectional in nature and, therefore, causal conclusions cannot be drawn from the data. Future research would benefit from examining whether associations among attachment style, emotion dysregulation, and outcomes of depression and meaning made might change over the course of adjustment after a stressor. Participants also reported a range of stressful events, from life events such as sudden abandonment by a spouse/partner, parent, or family to traumatic events such as sexual assault. The differences in severity of these stressors may impact participants' reports of the variables of interest.

The present study examined the effects various emotion regulation strategies have on the associations between attachment anxiety, attachment avoidance, and depression, as well as meaning made, and was the first study to examine whether the use of emotion regulation strategies can predict whether individuals are likely to make meaning out of their stressful life events. Our results suggest that attending to one's feelings and being hopeful or believing that emotions can be effectively regulated may be key mechanisms through which individuals with high attachment anxiety or avoidance can reduce the potential negative mental health impact that stressful life events may have, and that individuals with high attachment anxiety may benefit from engaging in goal-directed behavior following stressful life events.

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