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Attachment and Mental Health in the COVID-19 Pandemic: Posttraumatic Growth and Religion as Moderators

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Abstract: Consistent with the teachings in various religious traditions of finding meaning amidst suffering, we suspected that Posttraumatic Growth (PTG) would have a buffering effect on attachment insecurity and psychosocial outcomes. We examined the effects of anxious and avoidant attachment, PTG, and religion on psychosocial outcomes (i.e., anxiety, depression, and loneliness). Data from 466 participants recruited from Amazon Mechanical Turk (MTurk) and a college student sample revealed that PTG served as a moderator between anxious attachment and (a) depression and (b) loneliness, and (c) PTG buffered the relationship between anxious attachment and anxiety to a greater extent among Christians, compared to non-Christians. On the other hand, (a) PTG did not moderate the link between attachment avoidance and depression, (b) PTG exacerbated the relationship between attachment avoidance and anxiety, and (c) PTG buffered the association between attachment avoidance and loneliness for non-Christians, but this link was amplified for Christians. We discuss the findings that PTG interacted with religion and offered protective effects for anxious (but not avoidant) attachment. Factors that may have contributed to the difference between the two attachment styles are discussed, along with implications from cultural-religious and adult attachment frameworks.

Keywords: anxious attachment; avoidant attachment; posttraumatic growth; anxiety; depression; loneliness

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1. Introduction

The psychological impacts of the COVID-19 pandemic are numerous and wide-ranging, causing what some consider to be a "psychiatric pandemic" (Mortazavi et al. 2020). A study conducted in June 2020 found that US adults endured symptoms of anxiety, depression, trauma, and stressor related disorders (TSRD), as well as substance use and suicidal ideations, at rates ranging from 13.3% to 40.9%, which was an increase from the year prior (Czeisler et al. 2020). Many factors have contributed to the elevated levels of mental health concerns: grief and loss, including traumatic losses (Chen and Tang 2021), uncertainties surrounding the nature of the virus (Masiero et al. 2020), decision fatigue (Masiero et al. 2020), isolation and decreased social support (Walsh 2020; Reger et al. 2020), and financial insecurities (Walsh 2020; Reger et al. 2020). Given its pervasive impact, and the ways in which people's coping mechanisms can be overwhelmed, Masiero et al. (2020) argue that the COVID-19 pandemic was a source of individual and collective traumas. In this paper, we examine the unique and shared effects of attachment (avoidance and anxiety), posttraumatic growth, and religion on the development of psychological and interpersonal outcomes in the context of the COVID-19 pandemic.

1.1. Attachment Theory

Attachment theory is an empirically-based developmental framework for understanding a variety of psychological processes across the lifespan, including emotion regulation, care-seeking, and perception of threat amidst stressful situations (Bartholomew and

Horowitz 1991; Kidd et al. 2011; Mikulincer and Shaver 2017). Initially developed by Bowlby (1973, 1980) for understanding how parent–infant relationships contribute to psychological symptoms, and later tested and elaborated by Ainsworth et al. (1978), attachment theory has since been extended to explain psychosocial functioning in adulthood (Karen 1994; Mikulincer and Shaver 2017). Adult attachment researchers conceptualize attachment across the two orthogonal dimensions of attachment avoidance, characterized by discomfort with interpersonal closeness and excessive self-reliance, and attachment anxiety, characterized by fear of abandonment and rejection; attachment security is characterized by a capacity for closeness and independence and conceptualized as low levels of avoidance and anxiety (Brennan et al. 1998; Hazan and Shaver 1987).

These attachment styles inform people's stress management and emotional regulation (Mikulincer and Shaver 2017). For example, securely attached individuals are able to validate their own emotions and use them in beneficial ways when facing challenges. When facing aspects of the problems that are outside their control, they reappraise their perceptions in more positive ways and seek support in the process. On the other hand, avoidantly attached individuals downplay their emotions in the service of self-reliance, and anxiously attached individuals are reactive to stress (i.e., engaging in hyperarousal of stress) and are particularly attuned to distress (Kidd et al. 2011). In addition, even in the presence of social support, anxiously attached individuals may subjectively perceive receiving little support (Mikulincer and Shaver 2017). All of these make insecurely attached individuals more prone to psychological disorders (Mikulincer and Shaver 2017).

Emotional regulation strategies are activated when facing stressful situations (Mikulincer and Shaver 2017). Under low-stress circumstances, most people (independent of their attachment style) are able to manage their functioning and activities with sufficient self-concept and social resources. In particular, attachment style appears to predict vulnerability to psychopathology when facing stressors or crises (Mikulincer and Shaver 2017). The COVID-19 pandemic and its effects on various life domains (e.g., work, family, losses) has been a pervasive, chronic stressor that has affected a substantial proportion of the population. Recent work has supported the stress-regulation perspective for COVID-19, in that attachment anxiety (but not attachment avoidance) predicted worse mental health during the COVID-19 pandemic, even after controlling for pre-pandemic mental health levels (Moccia et al. 2020; Vowels et al. 2022).

1.1.1. Insecure Attachment and Mental Health

Adult attachment scholars have expanded upon Bowlby's (1988) notion that people with insecure attachment develop psychological symptoms due to the disruption in the emotional regulation processes described above. The evidence for the effects of attachment insecurity on psychopathology is overwhelming. Numerous studies have found that insecure attachment predicts anxiety and depression with larger effect sizes for attachment anxiety than attachment avoidance (Bekker and Croon 2010; Eng et al. 2001; Jinyao et al. 2012; Muris et al. 2001; Nottage et al. 2022; Ng and Hou 2017; Safford et al. 2004; Surcinelli et al. 2010). Further, Huang et al. (2019) found that attachment predicts the severity of mental health outcomes. Specifically, insecurely attached individuals are more likely to endorse multiple anxiety disorders as well as a comorbidity of anxiety and depression disorders (Huang et al. 2019).

1.1.2. Insecure Attachment and Loneliness

Loneliness is the subjective experience of deficiencies in one's relationships (De Jong Gierveld and Tilburg 2006). It is the discrepancy between desired and actual level of quantity or quality in one's relationships (Peplau et al. 1979). While loneliness is not a diagnostic category in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), it is an important indicator of interpersonal health that is especially relevant when considering the COVID-19 pandemic. For example, isolation and loneliness have been shown to be a predictor of suicidality (Van Orden et al. 2010), as well as depression and

substance use (Nottage et al. 2022). While most studies examining the relationship between attachment and mental health have primarily focused on anxiety and depression, loneliness has been a common experience during the COVID-19 pandemic (Killgore et al. 2020) and has been found to be a factor in psychological distress (e.g., Zawadzki et al. 2013).

As described above, securely attached individuals have more positive views of themselves and others (Bartholomew 1990; Mikulincer and Shaver 2017). In addition to being a major stressor, the COVID-19 pandemic also had a direct impact on the norms of social connections. In the face of the stressors and significant limitations on social interactions, it is possible that secure individuals would be able to hold a healthier schema of self and others while exploring alternative (i.e., remote) methods of remaining socially connected amidst COVID-19 restrictions. Indeed, insecurely attached individuals report more loneliness (Bernardon et al. 2011; DiTommaso et al. 2003). Anxiously attached individuals may find it difficult to regulate their distress given the fears of abandonment or rejection that may be activated by the stresses of the pandemic. Avoidantly attached individuals may withdraw further in reaction to the crisis, although they may not experience as much subjective loneliness as a result, at least initially. Given that our data was collected over one year after COVID-19 was declared to be a pandemic (Centers for Disease Control and Prevention n.d.), it is possible that the longer-term impact of the pandemic was associated with greater loneliness among avoidantly attached individuals.

1.2. Posttraumatic Growth (PTG)

People who experience crises often report subsequent growth, meaning, and greater life satisfaction (Calhoun et al. 2010; Tedeschi and Calhoun 2004; Calhoun and Tedeschi 2006; Janoff-Bulman 1992, 2006; Triplett et al. 2012). These sequelae have been conceptualized as posttraumatic growth (PTG), defined as the experience of positive psychological changes after experiencing a crisis or a highly stressful event (Calhoun and Tedeschi 1999, 2001; Tedeschi and Calhoun 2004). Their growth is reported in the following five domains: relating to others, new possibilities, personal strength, spiritual change, and appreciation for life (Tedeschi and Calhoun 1996). When examining PTG in relation to the COVID-19 pandemic in particular, we find that PTG is reported as a response to the COVID-19 pandemic stress (e.g., Na et al. 2021). In fact, within the relatively short time since the start of the pandemic, PTG has drawn much interest in the psychological literature (e.g., Bowling and Schumm 2021; Gonda and Tarazi 2022; Kalaitzaki et al. 2022; Northfield and Johnston 2022; Rhoads 2021; Stallard et al. 2021).

Many studies have examined the psychological correlates of PTG in relation to the COVID-19 pandemic (e.g., Aafjes-van Doorn et al. 2022; Chasson et al. 2022; Chen and Tang 2021; Shigemoto 2022; Ulset and Soest 2022), including some that explored the relationship between PTG and psychological adjustment (Hyun et al. 2021; Miragall et al. 2021). Among the literature on PTG related to the COVID-19 pandemic, to the authors' knowledge, there is only one study that has examined PTG as a moderator between pandemic-related stress and psychological adjustment (Aggar et al. 2022) and none on PTG as a moderator between attachment and mental health. Aggar et al. (2022) found that PTG had a moderating effect on anxiety, depression, and well-being among Australian nurses. In light of this finding, we suspect PTG would also have a buffering effect on psychosocial outcomes in the broader population. Given the prevalent evidence of attachment styles in predicting mental health, it is important to discover factors that would serve as moderators to inform public health policy and mental health practitioners in mitigating the psychiatric impact of the COVID-19 pandemic.

1.3. Religion

Many religious and spiritual traditions provide a framework for reflecting on experiences of suffering, from meaning making, to relating to one's community and the divine amidst suffering (Bemporad 1987; Linley 2003; Xiong et al. 2020). In fact, a systematic review of PTG as it relates to religiosity and spirituality (R/S) found that R/S typically has

a positive impact when wrestling with the impact of a crisis (Shaw et al. 2005). Specific religious factors, such as positive religious coping (e.g., Chan and Rhodes 2013; Gerber et al. 2011), moderate religious service attendance (Tobin et al. 2018) and religious quest orientation (Calhoun et al. 2000), are predictive of PTG. In a study examining factors associated with PTG among tsunami survivors in Kerala, India, religion is one of the two factors (along with employment) that consistently emerged as a significant predictor across the hierarchical regression models (Augustine 2014). It is of note that Augustine (2014) also found that, while both Hindus and Christians report PTG, Christians report significantly higher levels of PTG. Altogether, religion appears to be an important variable that is closely connected to PTG and may provide further insight into ways in which adverse mental health outcomes may be curbed.

1.4. Present Study

In sum, individuals with attachment anxiety are likely to engage in hyperarousal emotional regulation strategies, which in turn predict greater unnecessary worrying (i.e., anxiety symptoms), negative views of the situation, of self and of other (i.e., depression symptoms), and perceive lower engagement with others (i.e., loneliness). Likewise, people with attachment avoidance are likely to disengage emotionally from their distress and from close relationships, which over time, and as a result of a deteriorated defense system, results in greater psychological symptoms. It is likely, therefore, that attachment styles would predict greater anxiety and depression during the COVID-19 pandemic. In addition to anxiety and depression, we also examined loneliness as a variable in this study, given its role as a mediator in important mental health outcomes.

To the authors' knowledge, no study has examined PTG as a moderator between attachment and psychosocial adjustments related to the COVID-19 pandemic. In the present study, we conceptualized PTG specifically as related to stress responses from the COVID-19 pandemic crisis (COVID-19 Pandemic PTG), and we are testing a theoretical model that PTG would buffer the link between attachment and psychosocial adjustments. This model is based on (a) the preponderance of evidence that insecure attachment predicts poorer psychosocial adjustments, (b) evidence that PTG has emerged as a response to the COVID-19 pandemic, and (c) the finding in Aggar et al.'s (2022) study that PTG moderates the relationship between pandemic-related stress and psychosocial adjustment. Finally, given that religion is an important meaning making resource, particularly for traumatic events, we also conceptualized religion as a moderator, enhancing PTG's buffering effect. Altogether, the present study examined the effects of attachment insecurity, PTG, and religion on anxiety, depression, and loneliness, and we proposed a moderated moderation model (see Figure 1) to examine the following hypotheses:

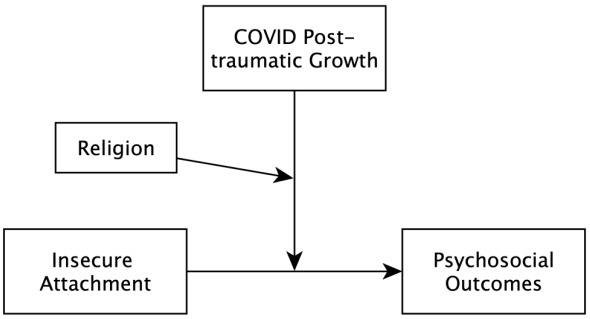

Figure 1. Hypothesized model testing whether the relationship between insecure attachment (i.e., avoidance and anxiety) and psychosocial outcomes is moderated by COVID-19-related posttraumatic growth, and whether the two-way interaction between attachment and posttraumatic growth depends on participant religion.

Hypothesis 1. (H1). *Attachment anxiety and attachment avoidance will be significantly positively correlated with poorer psychosocial outcomes (i.e., anxiety, depression, and loneliness). Based on previous research, we anticipate for the associations to be stronger for attachment anxiety than for attachment avoidance.*

Hypothesis 2. (H2). *COVID-19-related PTG will moderate the relationship between insecure attachment dimensions (i.e., anxious and avoidant) and psychosocial outcomes (i.e., anxiety, depression, and loneliness). Specifically, PTG will significantly weaken or buffer the association between attachment insecurity and negative psychosocial outcomes.*

Hypothesis 3. (H3). *Finally, religion will moderate the moderating effects of PTG, such that the buffering effects of PTG will be particularly beneficial for Christian participants on the relationship between attachment insecurity and psychosocial outcomes.*

2. Materials and Methods

2.1. Participants and Procedure

A total of 574 participants were recruited from the SONA Experiment Management System (n = 156) and Amazon Mechanical Turk (MTurk; n = 418) between 5 October 2021 and 11 January 2022. The inclusion criteria were as follows: aged between 18 and 64 and resident in the United States. Participants from MTurk received USD 0.75 Amazon credit upon completing the survey. SONA was administered to undergraduate students at a private university in Southern California, and students received SONA credit upon completion of the survey. Three validity items were embedded within the survey to ensure that participants were paying attention (e.g., "For this statement, please slide to 7"). A total of 108 participants were excluded for having one or more incorrect or unanswered validity items.

The final sample included 466 participants, of which 53.4% identified as female, 45.9% as male, and 0.6% as transgender (n = 1 transfeminine, n = 2 transmasculine). Participant ages ranged from 18 to 70 years (M = 35.26, SD = 13.51). Most of the participants were non-Hispanic white (69.3%), followed by Asian or Pacific Islander (9.7%), Hispanic or Latinx (9.4%), African American or Black (6%), Native American (2.8%), and Multiracial (2.1%). In regard to self-reported religious affiliation, 75.8% of participants identified as Christian, 15.5% identified as atheist or agnostic, 1.7% as Jewish, 0.9% as Buddhist, 0.6% as Muslim, 0.4% as Hindu, and 4.9% as "Other". Most of the participants identified as heterosexual (77.5%), followed by bisexual (16.5%), and less than 2% of pansexual (1.5%), lesbian (1.1%), gay (1.1%), queer (0.2%), and other or no answer (1.7%). Finally, half of the participants were married; 34.5% were single (never married); 12.2% dating, engaged, or cohabitating; 3% were divorced or separated; and 1 person (0.2%) was widowed.

2.2. Materials

Attachment styles. Attachment styles were measured using the Experiences in Close Relationships-Revised Questionnaire (ECR-R; Fraley et al. 2000), which demonstrates adequate reliability and validity as a measure of adult romantic attachment (Sibley et al. 2005). This scale measures attachment on two dimensions: anxious attachment and avoidant attachment, consisting of 18 items each. Participants responded to items such as "I'm afraid that I will lose my partner's love" (anxious attachment) and "I prefer not to show a partner how I feel" (avoidant attachment). Responses were recorded on a Likert scale of 1 = *strongly disagree* to 7 = *strongly agree*. The Cronbach's alphas for the anxious and avoidant dimensions were 0.95 and 0.93, respectively.

COVID-19-related posttraumatic growth (PTG). PTG was measured using the Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun 1996), which is a 21-item scale measured on a six-point Likert scale (0 = *I did not experience this change as a result of my crisis* to 6 = *I experienced this change to a very great degree as a result of my crisis*). For this study, participants were asked to respond to the items as they relate to the COVID-19 pandemic,

with the following instruction: "Please respond to the following questions regarding the COVID-19 crisis. ("crisis" refers to the COVID-19 pandemic)." Participants responded to items such as "I changed my priorities about what is important in life," and "I learned a great deal about how wonderful people are." The reliability of the scale was 0.90 (Tedeschi and Calhoun 1996). In the present study, Cronbach's alpha was 0.96.

Anxiety. The Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al. 2006) is a brief measure anxiety that has excellent reliability ($\alpha = 0.92$). Participants are asked to rate how often they have experienced symptoms of anxiety in the last two weeks, such as "feeling nervous, anxious, or on edge" or "trouble relaxing." Responses were rated on a four-point Likert scale ranging from 0 = *not at all* to 4 = *nearly everyday*. The Cronbach's alpha in this study was 0.92.

Depression. Depression was assessed using the Center for Epidemiologic Study-Depression, 10-item version, which is a depression symptom screener exhibiting reliability coefficients ranging from 0.85 to 0.90 (Radloff 1977). Participants were asked to report which symptoms they experienced in the previous week on items such as "I felt depressed" and "I felt that everything I did was an effort". Although the original scale had a four-point Likert scale (from "rarely or none of the time" to "all of the time"), due to administrative error, we used a "yes" or "no" response option. Despite this, the internal consistency reliability was adequate, as the Cronbach's alpha in the present study was 0.79.

Loneliness. Loneliness was measured using the six-item Scale for Overall, Emotional and Social Loneliness (De Jong Gierveld and Tilburg 2006). Participated rated items such as "I miss having people around" and "often, I feel rejected" on a four-point Likert scale, from 1 = strongly disagree to 4 = strongly agree. The scale exhibits good reliability, ranging between 0.70 and 0.76. The Cronbach's alpha in the present study was 0.69.

3. Results

Bivariate correlations (see Table 1) were conducted using SPSS Version 28.0 (IBM Corp 2021) between attachment dimensions and psychosocial outcomes (H1). Results indicated significant correlations (all at $p < 0.001$) between attachment anxiety and attachment avoidance with depression symptoms ($r = 0.38$ and 0.41, respectively), anxiety symptoms ($r = 0.47$ and 0.63, respectively), and loneliness/isolation ($r = 0.45$ and 0.47, respectively). Attachment anxiety was positively linked with COVID-19-related PTG ($r = 0.29$, $p < 0.001$), though the correlation between attachment avoidance and PTG was not significant ($r = 0.07$, $p = 0.174$).

Table 1. Pearson's Correlations for Study Variables.

	M	*SD*	1	2	3	4	5
1. ECR-AX	3.17	1.44	—				
2. ECR-AV	3.18	1.22	0.42 **	—			
3. PTG	2.83	1.17	0.36 **	−0.06	—		
4. Loneliness	3.83	0.562	0.48 **	0.45 **	−0.02	—	
5. Depression	0.404	0.282	0.41 **	0.38 **	0.01	0.55 *	—
6. Anxiety	2.90	1.15	0.63 **	0.47 **	0.26 **	0.52 **	0.63 **

Note. Regression coefficients are unstandardized. ECR-AX = Attachment anxiety subscale of the Experiences in Close Relationships Scale, ECR-AV = Attachment avoidance subscale of the Experiences in Close Relationships Scale, PTG = COVID-19-related posttraumatic growth. * $p < 0.01$. ** $p < 0.05$.

Testing the Moderated Moderation Hypothesis

We tested the moderation (H2) and moderated moderation analyses (H3) using conditional process modeling with PROCESS macros for SPSS (Hayes 2012). First, we examined moderated moderation effects (using PROCESS Model 3) in which attachment avoidance and anxiety were entered as predictors (X); COVID-19-related PTG was entered as the moderator (W); religion was entered as the second moderator (Z); and loneliness, depression, and anxiety were entered as separate outcome variables (Y). Due to the limited number of

non-Christian religious participants in our sample, we operationalized this dummy-coded religion variable by combining non-Christian religious and non-religious participants as the reference group and Christians as the comparison group (Christian = 1, Other = 0). If the moderated moderation analyses were not significant, we ran a moderator analysis (using PROCESS Model 1) with PTG as the only moderator on the link between attachment and psychosocial outcomes. Simple slopes analyses were conducted to calculate the conditional effects of the moderators, fixing the PTG values at the mean, one standard deviation below the mean, and one standard deviation above the mean. Regression analyses were conducted separately for each predictor (i.e., attachment anxiety and avoidance) and for each psychosocial outcome (i.e., depression, anxiety, and loneliness).

Attachment Anxiety

The regression analyses of attachment anxiety predicting loneliness resulted in a nonsignificant three-way attachment anxiety × PTG × religion interaction ($b = -0.02$, $SE = 0.02$, $p = 0.354$, 95% $CI = [-0.05, 0.02]$). However, the regression with the attachment anxiety × PTG two-way interaction was significant ($b = -0.05$, $SE = 0.01$, $p = 0.001$, 95% $CI = [-0.07, -0.02]$) (see Table 2). Results from the simple slopes analysis (see Figure 2, Panel A) indicated that the effects of attachment anxiety predicting loneliness was stronger at low levels of PTG ($b = 0.27$, $p < 0.001$) than at medium levels of PTG ($b = 0.22$, $p < 0.001$), and at high levels of PTG ($b = 0.16$ $p < 0.001$). This suggests that PTG had a buffering effect on the relationship between attachment anxiety and feelings of loneliness, though the moderated moderation effect was not supported.

Table 2. Regression Analysis Testing Moderation Effects of Posttraumatic Growth on Insecure Attachment Dimensions (Anxiety and Avoidance) on Psychological Outcomes ($N = 430$).

	Loneliness/Isolation				**Depression Symptoms**				**Anxiety Symptoms**			
	b	***SE***	**95% *CI***	**ΔR^2**	***b***	***SE***	**95% *CI***	**ΔR^2**	***b***	***SE***	**95% *CI***	**ΔR^2**
Constant	2.32 ***	0.02	[2.27, 2.36]	0.28	0.42 ***	0.01	[0.39, 0.45]	0.20	2.92 ***	0.10	[2.72, 3.12]	0.41
ECR-AX	0.22 ***	0.01	[0.18, 0.25]		0.09 ***	0.01	[0.08, 0.11]		0.55 ***	0.07	[0.41, 0.69]	
PTG	−0.13 ***	0.02	[−0.17, −0.08]		−0.05 ***	0.01	[−0.08, −0.03]		0.12	0.08	[−0.04, 0.27]	
ECR-AX × PTG	−0.05 **	0.01	[−0.07, −0.02]	0.02	−0.02 **	0.01	[−0.04, −0.01]	0.02	0.11 *	0.05	[0.01, 0.20]	
Religion									0.02	0.12	[−0.21, 0.24]	
ECR-AX × Religion									−0.03	0.08	[−0.19, 0.13]	
PTG × Religion									−0.08	0.10	[−0.27, 0.11]	
ECR-AX × PTG × Religion									−0.16 **	0.06	[−0.28, −0.05]	0.01
	Loneliness/Isolation				**Depression Symptoms**				**Anxiety Symptoms**			
	b	***SE***	**95% *CI***	**ΔR^2**	***b***	***SE***	**95% *CI***	**ΔR^2**	***b***	***SE***	**95% *CI***	**ΔR^2**
Constant	2.25 ***	0.06	[2.15, 2.36]	0.21	0.40 ***	0.01	[0.38, 0.43]	0.14	2.91 ***	0.05	[2.82, 3.00]	0.31
ECR-AV	−0.03 **	0.04	[0.05, 0.21]		0.08 ***	0.01	[0.06, 0.11]		0.48 ***	0.04	[0.40, 0.56]	
PTG	−0.03	0.02	[−0.09, 0.05]		0.004	0.01	[−0.02, 0.03]		0.30 ***	0.04	[0.22, 0.37]	
ECR-AV× PTG	−0.03	0.02	[−0.08, 0.01]		−0.01	0.01	[−0.02, 0.01]		0.06 *	0.03	[0.001, 0.11]	0.01
Religion	0.01	0.06	[−0.11, 0.13]									
ECR-AV× Religion	0.10 *	0.05	[0.004, 0.19]									
PTG × Religion	0.06	0.05	[−0.03, 0.15]									
ECR-AV × PTG × Religion	0.07 *	0.03	[0.01, 0.13]	0.01								

Note. Regression coefficients are unstandardized. ECR-AX = Attachment anxiety subscale of the *Experiences in Close Relationships Scale*, PTG = COVID-19-related posttraumatic growth, ECR-AV = Attachment avoidance subscale of the *Experiences in Close Relationships Scale*. *** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Next, the regression analysis of attachment anxiety on depression symptoms indicated a nonsignificant three-way attachment anxiety × PTG × religion interaction ($b = -0.02$, $SE = 0.06$, $p = 0.354$, 95% $CI = [-0.05, 0.02]$), suggesting the moderated moderation was not supported. However, results from the two-way attachment anxiety × PTG interaction were significant ($b = -0.02$, $SE = 0.01$, $p = 0.003$, 95% $CI = [-0.04, -0.01]$) (see Table 2). Results from the simple slopes analysis (see Figure 2, Panel B) indicated that the strength of the effect of attachment anxiety on depression symptoms decreased with higher PTG. Specifically, the unstandardized coefficient for attachment anxiety predicting depression was stronger at low levels of PTG ($b = 0.12$, $p < 0.001$) than at medium levels of PTG

($b = 0.09$, $p < 0.001$), and high levels of PTG ($b = 0.07$ $p < 0.001$). This suggests that PTG had a buffering effect on the relationship between attachment anxiety and depression symptoms.

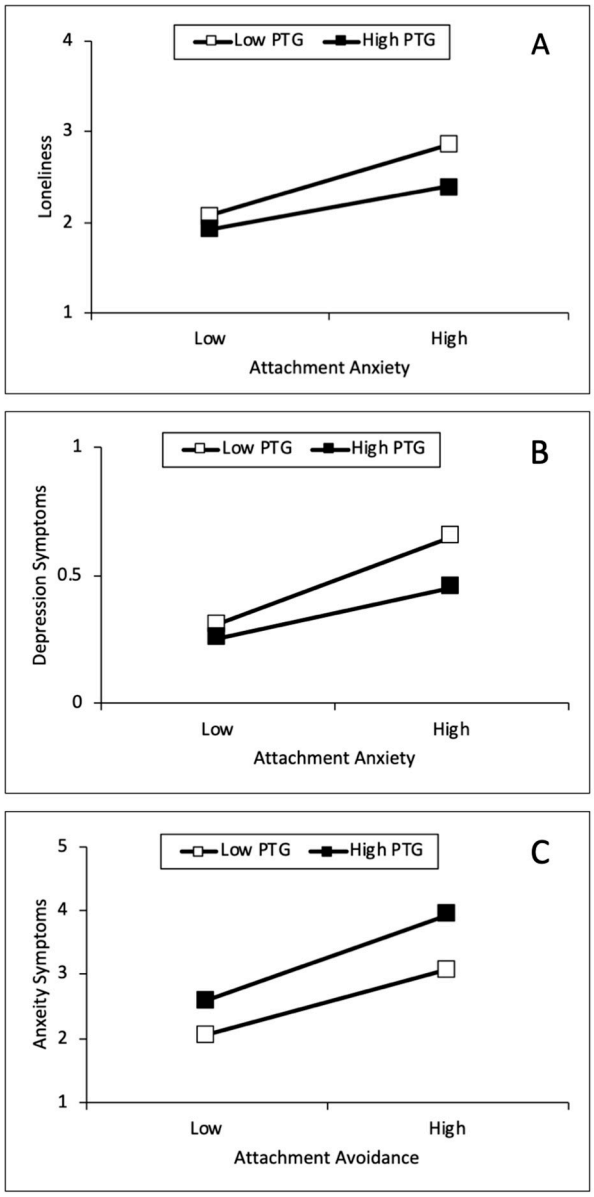

Figure 2. The interaction between attachment anxiety and COVID-19 posttraumatic growth on loneliness (**A**) and on depression symptoms (**B**); and the interaction between attachment anxiety and COVID-19 posttraumatic growth on anxiety symptoms (**C**). *Note.* PTG = COVID-19-related posttraumatic growth.

Third, the regression analysis of attachment anxiety predicting anxiety symptoms revealed a significant three-way interaction ($b = -0.16$, $SE = 0.06$, $p = 0.006$, 95% $CI = [-0.28, -0.05]$) (see Table 2), suggesting that the moderation by PTG was dependent on religious identity. Results from the simple slopes analysis (see Figure 3, Panel A) confirmed that the moderation effect of PTG varied across religious groups. Specifically, for non-Christian participants the link between attachment anxiety and anxiety symptoms increased from low PTG ($b = 0.43$, $p < 0.001$) to high PTG ($b = 0.67$, $p < 0.001$). Conversely, for Christians, the effect of attachment anxiety on anxiety symptoms decreased from low PTG ($b = 0.58$, $p < 0.001$) to high PTG ($b = 0.45$, $p < 0.001$). This suggests that PTG functions as a buffer of

the effects of attachment anxiety on anxiety symptoms for Christians, but it exacerbates this relationship for non-Christians.

Attachment Avoidance

Regression analyses for attachment avoidance were conducted separately for depression, and anxiety. The regression analyses predicting loneliness resulted in a significant three-way interaction between attachment avoidance, PTG, and religion for predicting loneliness. Specifically, the moderation by PTG was dependent on religious identity ($b = 0.07$, $SE = 0.03$, $p = 0.032$, 95% $CI = [0.01, 0.13]$) (see Table 2). Results from the simple slopes analysis (see Figure 3, Panel B) confirmed that the moderation effects of PTG varied across religious groups. For non-Christians, PTG weakened the relationship between attachment avoidance and loneliness. Specifically, attachment avoidance significantly predicted loneliness at low levels of PTG ($b = 0.17$, $p < 0.001$), but this effect was not significant at high levels of PTG ($b = 0.09$, $p = 0.118$). For Christian participants, PTG strengthened the link between attachment avoidance and loneliness: the unstandardized coefficient increased from low levels of PTG ($b = 0.19$, $p < 0.001$) to high levels of PTG ($b = 0.27$, $p < 0.001$). Taken together, PTG buffered the detrimental effects of attachment avoidance on loneliness for non-Christians, but it exacerbated this effect for Christians.

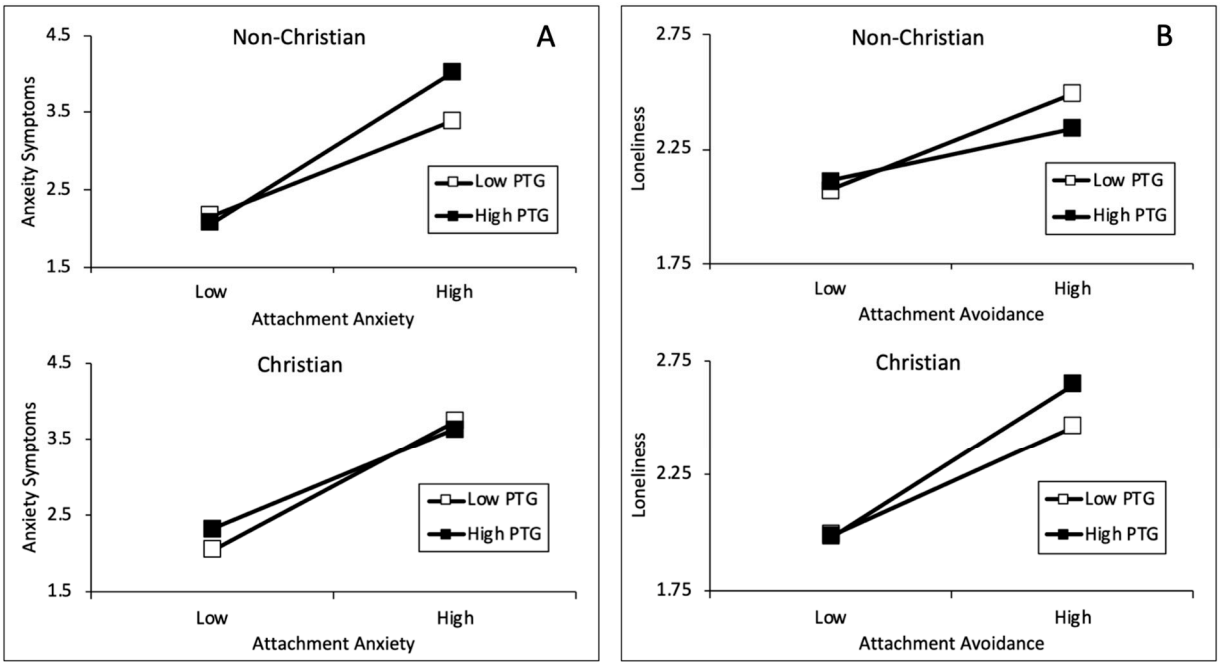

Figure 3. The interaction between (**A**) attachment anxiety and COVID-19 posttraumatic growth on anxiety symptoms by religious identity (i.e., non-Christian vs. Christian) and (**B**) attachment avoidance and COVID-19 posttraumatic growth on loneliness by religious identity (i.e., non-Christian vs. Christian). *Note.* PTG = COVID-19-related posttraumatic growth.

Next, the regression analyses predicting depression indicated a nonsignificant three-way avoidance × PTG × religion interaction ($b = 0.01$, $SE = 0.06$, $p = 0.185$, 95% $CI = [-0.04, 0.20]$) and a nonsignificant two-way avoidance × PTG interaction ($b = -0.01$, $SE = 0.01$, $p = 0.384$, 95% $CI = [-0.02, 0.01]$) (see Table 2). This suggests that PTG was not a significant moderator, and that religion was not a conditional moderator of PTG on the relationship between attachment avoidance and depression.

Finally, the regression analysis predicting anxiety symptoms indicated a nonsignificant three-way interaction ($b = 0.01$, $SE = 0.06$, $p = 0.185$, 95% $CI = [-0.04, 0.20]$), suggesting that the moderated moderation effect of religion and PTG was not supported. However, results from the avoidance × PTG interaction were significant ($b = 0.06$, $SE = 0.03$, $p = 0.047$, 95% $CI = [0.001, 0.11]$) (see Table 2). Results from the simple slopes analysis (see Figure 2,

Panel C) indicated that the link between attachment avoidance and anxiety increased from low PTG ($b = 0.42$, $p < 0.001$) to medium PTG ($b = 0.48$, $p < 0.001$), and to high PTG ($b = 0.55$, $p < 0.001$), suggesting that PTG exacerbated (rather than buffered) the effects between attachment avoidance on anxiety symptoms.

4. Discussion

Our study examined variables that moderated the relationship between attachment styles and psychosocial outcomes as it relates to the COVID-19 pandemic. To our knowledge, this is the first study that examined PTG and religion as moderating variables between attachment styles and psychosocial outcomes. There are a few notable findings in our study. Hypothesis 1 was supported in that attachment avoidance and attachment anxiety were correlated with all three psychosocial outcomes: depression, anxiety, and loneliness. Hypothesis 2 was partially supported, as follows: PTG moderates the link between (a) attachment anxiety and depressive symptoms, and (b) attachment anxiety and loneliness. However, PTG was not found to be a moderator for the relationship between attachment avoidance and depression. Our study found partial support for Hypothesis 3 in that PTG attenuated the relationship between attachment anxiety and anxiety symptoms for Christians, but this link was exacerbated for non-Christians.

In addition, there were a few puzzling findings in our study. First, instead of being a buffer, PTG emerged as an exacerbating variable in the link between attachment avoidance and anxiety. Additionally, contrary to Hypothesis 3, PTG attenuated the link between attachment avoidance and loneliness for non-Christians, but this link was exacerbated for Christians. In this section, we will first discuss the outcomes that were consistent with our hypotheses, including possible implications. We will then discuss the outcomes that were not consistent with our hypotheses and draw from the literature in interpreting these findings. Finally, we highlight limitations in our studies and offer our thoughts on future directions.

PTG and Religion as Buffers for Attachment Anxiety

Consistent with Hypothesis 1, attachment avoidance and attachment anxiety were correlated with depression, anxiety, and loneliness. This finding is consistent with the general consensus that insecure patterns of adult attachment are related to anxiety and depression, and that the effects on anxiety symptoms were greater for attachment anxiety than avoidance (for a review, see Mikulincer and Shaver 2017). Anxiously attached individuals respond to stress with hyperarousal and are more likely to perceive challenges as more stressful. In particular, COVID-19-related stressors are likely enhanced among people with attachment anxiety. Conversely, those with attachment avoidance may minimize external stressors related to the pandemic, though this defense has likely deteriorated over the long term. Although we did not hypothesize this, our findings documented the positive link between attachment anxiety and COVID-19-related PTG, while the relationship between attachment avoidance and PTG was not significant. Past research on the link between attachment anxiety and PTG has been mixed, with some studies finding a positive correlation (e.g., Arikan and Karanci 2012), while others have found a negative correlation (e.g., Nelson et al. 2019). The relationship between attachment avoidance and PTG is small, albeit consistently negative (e.g., Gleeson et al. 2021). Our study is at least consistent with past research that has found the relationship between the particular types of attachment insecurity and PTG to be inconsistent, though this also calls into question the conclusion that attachment security is positively linked with PTG (Gleeson et al. 2021), because attachment security is conceptualized as low avoidance and low anxiety (Brennan et al. 1998). This may be due to differences in measurement tools, because attachment security was not measured in our study (for a review, see Ravitz et al. 2010).

Hypothesis 2 stated that COVID-19-related PTG would buffer the negative effects of attachment insecurity on psychosocial outcomes; this hypothesis was partially supported. Specifically, the results found that COVID-19-related PTG moderated the negative effects of attachment anxiety on depressive symptoms and loneliness. Although the link was

still significant, the effect of attachment anxiety was weaker for those with high PTG, and PTG seemed to be particularly helpful for individuals with high anxiety. This finding is important because the attachment literature has established that anxious attachment leads to poorer psychosocial outcomes. As such, it is crucial that moderating variables are identified in order to mitigate this link, especially in light of a global crisis such as the COVID-19 pandemic that is likely to exacerbate anxiety. The literature has identified a number of interventions in fostering PTG, such as cognitive-behavioral therapy and expressive therapy (Roepke 2015), mindfulness-based interventions (Xunlin et al. 2020), and to a lesser extent, physical interventions, including yoga, health coaching, and sports (see Zhang et al. 2022). In other words, for individuals who have an anxious attachment style, these items of literature, along with our findings, provide possible avenues to foster PTG and limit adverse psychosocial outcomes when facing a crisis such as a global pandemic.

Our study also found partial support for Hypothesis 3, which tested a moderated moderation effects of religion and PTG on the link between attachment and psychosocial outcomes. Specifically, we anticipated that the buffering effect of PTG on insecure attachment would be enhanced for religious individuals. We reasoned that religious views would offer a framework when grappling with otherwise overwhelming traumatic experiences (e.g., COVID-19-related stress). This moderated moderation effect was supported for the link between attachment anxiety and anxiety symptoms. For Christian anxiously attached individuals, COVID-19-related PTG weakens the effects on anxiety symptoms. However, for non-Christians, PTG appears to exacerbate the negative effects of attachment anxiety. This is in line with our expectations that PTG may rely on a meaning-making framework (e.g., Christian faith system) for managing COVID-19-related stress.

PTG and Religion Exacerbating Attachment Avoidance

PTG did not moderate the effect of attachment avoidance and depressive symptoms. Moreover, instead of acting as a buffer, PTG emerged as having an exacerbating effect on the link between attachment avoidance and anxiety. This latter finding was contrary to our hypothesis. Our findings appear to concur with Mikulincer and Shaver (2017), stating when one component in the "web of mediators" is modified, it can then modify other mediators and components, potentially affecting all contributing factors to individual mental health. This line of reasoning implies a change in beliefs about the self can modify the regulation of emotion, which can have a positive impact on mental health. Thus, avoidantly attached individuals whose defenses have deteriorated and are engaging in PTG-related thoughts about self (e.g., needing to depend on others) may end up being more aware of worries about themselves or the world and developing psychological symptoms. This line of reasoning is consistent with research by Kleim and Ehlers (2009), who reported a curvilinear relationship between PTG and depression. The authors hypothesized some trauma survivors may use PTG to minimize symptoms by downplaying the outcome of the trauma. Taken together, the findings from Hypothesis 2 imply the effect of PTG can have a complex relationship as a moderator between attachment avoidance and depression and anxiety symptoms.

Contrary to Hypothesis 3, PTG attenuated the link between attachment avoidance and loneliness for non-Christians, but this link was exacerbated for Christians. This finding is certainly unexpected but may be interpreted in light of a few assumptions underlying our hypothesis. First, from an attachment perspective, PTG may simply be less useful for avoidantly attached Christians. These individuals may be using their faith as a coping mechanism and a way to minimize actual traumatic stress from the pandemic. While there are real and important stressful aspects to the pandemic (e.g., future variants, reinstitution of mandates such as wearing masks, proof of vaccination, higher retail prices, shortage of various goods, limits on public gatherings, and other significant restrictions) individuals with avoidant attachment are less likely to attempt meaning making and to deactivate their stress response. Christian religious people may be relying on their faith to expedite returning to normalcy while avoiding the overwhelming nature of the daily, evolving news about COVID-19.

Second, we conceptualized religion as a stable framework for making meaning out of traumatic stress, yet the links between religion or spirituality and posttraumatic growth have been mixed. One review of 11 studies found that practicing religion and spirituality is usually, but not always, beneficial in dealing with the aftermath of trauma (Shaw et al. 2005). For instance, Overcash et al. (1996) reported their subjects demonstrated no change in religious beliefs, while Schwartzberg and Janoff-Bulman (1991) found their subjects became more cynical and less religious following trauma. Thus, in the context of COVID-19-related trauma, avoidantly attached individuals who are attempting to engage in PTG thinking may demonstrate more cynicism toward religion, resulting in greater levels of loneliness. A differentiating factor may be the way that individuals engage with religion in the face of a crisis. The religious coping literature may be of value here. Pargament et al. (1998) identified two different patterns of religious coping: positive religious coping involves methods such as seeking spiritual support and connection, and a positive reframing of the crisis, while examples of negative religious coping include religious and spiritual discontent and experiencing the crisis as a punishment from God. Studies found that positive religious coping has been linked to PTG (Gerber et al. 2011), and especially pertinent to our study, negative religious coping has been linked to increased loneliness during the COVID-19 Pandemic (Yıldırım et al. 2021). In other words, how individuals engage with religion during a crisis is an important variable that should be examined in future studies on PTG and psychosocial outcomes during a crisis.

Finally, this finding may be interpreted from the unique nature of the stressor (i.e., the COVID-19 pandemic). Traumatic stress (and specifically PTG) is most often conceptualized from the individual experience (e.g., victim of sexual assault, witness to violence). As such, when a person undergoing stress has access to a stable community of individuals, PTG may be more likely to occur. In a study on the recovery of hurricanes Katrina and Rita, spiritual beliefs were found to be an important mechanism contributing to PTG, but this link was facilitated by one's faith community and religious practices (Tausch et al. 2011). As with natural disasters or other community-wide traumatic events, the COVID-19 pandemic has not only impacted individuals, but also the systems of support they previously had access to. In addition to businesses, schools, and government, people had less access to religious institutions. This notion has been supported by past work, which has found that Christians may not have benefited from PTG because of reduced access to their religious community during the pandemic, when many institutions were shut down (Reger et al. 2020). Given that religious institutions (e.g., churches) offer an important source of support for people's faith and spiritual well-being, the pandemic may have been particularly disruptive for religious individuals with an already lower support system, the same as with individuals with attachment avoidance.

Limitations and Future Directions

The findings should be interpreted in light of important limitations. Given the cross-sectional design of this study, we were not able to consider the effects of the pandemic as events changed, such as the emergence of different variants of the virus and the impact of increased vaccination rates and herd immunity. As of this writing, the COVID-19 pandemic is still extensive in different parts of the world, and the potential variants as well as mixed information about vaccine efficacy, mask wearing, strategic re-openings (and closures) of schools and businesses still contribute to feelings of anxiety. We recognize the limitations of generalizing our findings given the dynamic situation with the pandemic. More simply, there are challenges in trying to investigate a historical "moving target." Still, studies of natural disasters report ongoing recovery-related stressors impacting a community well after the calamity (Burnett et al. 1997).

We also acknowledge that the impact of religion extends beyond the Christian faith. In our initial research design, we anticipated a greater sample of individuals identifying as Atheist or Agnostic as well as those who do not identify with a particular religion (i.e., religious "nones"). In fact, this has been supported by previous meta-analyses or reviews studies which found 38% to 54% of mTurk workers identified as Atheist, Agnostic, or

non-religious (Burnham et al. 2018; Lewis et al. 2015). In our sample, 76% identified as Christian and only 15.5% identified as Atheist or Agnostic. A possible explanation for this sampling may be due to having recruited 27% of our sample from students from a faith-based institution. Consistent to this limitation is that we did not assess the level of religiosity. As such, our sample may inadvertently include individuals who selected the option of Christian, but in fact identified as religious "nones," though our demographic sections did not capture this notion. Future research exploring the links between attachment, PTG, and religiosity would benefit from examining participants as well as individuals identifying as Atheist or Agnostic. Research expanding on our study may explore specific variables related to religion and spirituality (e.g., types of religious coping) or specifying meaning-making strategies from a worldview perspective (Taves et al. 2018).

The present study contrasted Moccia et al. (2020), who reported secure and avoidant attachment styles were protective for mental health during COVID-19, which was inconsistent with our study (avoidant predicting loneliness). Their study was performed early in the pandemic (10–13 April 2020), so possibly the impact was more apparent when we collected data (5 October 2021 through 11 January 2022). Hence, as stated previously, avoidance may initially be a coping strategy, yet we cannot predict if avoidance can be maintained given the ongoing and chronic nature of the pandemic. We believe there would be highly useful information obtained from a longitudinal study to observe psychological changes over time, particularly because the virus appears to continually mutate and persist, which could result in COVID-19 becoming an endemic virus, indefinitely affecting populations worldwide. Continued research throughout and at the cessation of the pandemic can help further understanding PTG and how other facets can improve psychological health in the aftermath of crises.

5. Conclusions

To our knowledge, this study is the first to examine PTG and religion as moderators between attachment styles on psychosocial outcomes. Our study further confirms the link between attachment insecurity and psychosocial outcomes (depression, anxiety, and loneliness). Further, our study found support for our hypotheses, particularly among individuals who are anxiously attached. PTG served as a moderator between anxious attachment and (a) depression and (b) loneliness, and (c) PTG moderated the link between anxious attachment and anxiety to a greater extent among Christians compared to their non-Christian counterparts. While attachment insecurities present as vulnerabilities when facing stressors (Mikulincer and Shaver 2017), our study sheds light on possible ways to mitigate adverse psychological outcomes. When examining avoidant attachment as a predictor, however, our hypotheses were not supported. Specifically, (a) PTG was not found to be a moderator for the link between attachment avoidance and depression, (b) PTG exacerbated the relationship between attachment avoidance and anxiety, and (c) PTG buffered the association between attachment avoidance and loneliness for non-Christians, but this link was amplified for Christians.

In this paper, we referenced interventions that have been found to foster PTG, which have potential implications for educational settings, religious institutions, and mental health clinicians in supporting individuals and communities through crises, particularly as we continue to navigate the ongoing challenges of the COVID-19 pandemic. In light of the differential findings between anxious and avoidant attachment, practitioners seeking to apply PTG in clinical settings should be aware that while PTG likely offers an important framework for people with anxious attachment, this may not be the case for people with avoidant attachment. Overall, our study contributes further insight into the literature about how anxious and avoidant attachment styles may interact differently with religion and PTG when examining psychosocial outcomes such as anxiety, depression, and loneliness.

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