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**Using Path Modeling to Investigate the Impact of Adverse Childhood Experiences on  
Post-Traumatic Growth through Meaning-Making, Resilience, and PTSD Symptoms**

A DISSERTATION

Submitted to the Faculty of  
Montclair State University in partial fulfillment  
of the requirements  
for the degree of Doctor of Philosophy

by

Sowmya Kshtriya

Montclair State University

Montclair, NJ

May 2023

Dissertation Chair: Dr. Paul Amrhein, PhD

MONTCLAIR STATE UNIVERSITY  
THE GRADUATE SCHOOL  
DISSERTATION APPROVAL

We hereby approve the Dissertation

**Using Path Modeling to Investigate the Impact of Adverse Childhood Experiences on  
Post-Traumatic Growth through Meaning-Making, Resilience, and PTSD Symptoms**

of

Sowmya Kshtriya

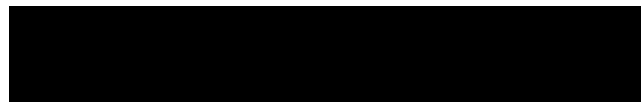
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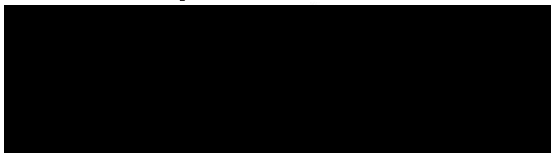
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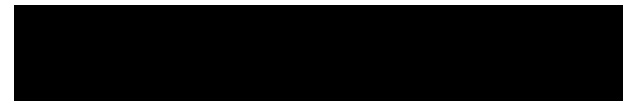


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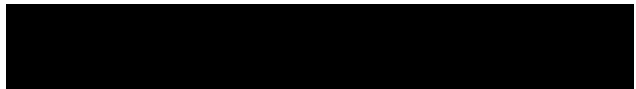
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08/09/2022

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Dr. Michael Bixter

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## Abstract

Background: Research has revealed an important relationship between adverse childhood experiences (ACEs) and post-traumatic growth (PTG) through direct and indirect processes, involving three probable mediators, meaning-making, resilience, and post-traumatic stress disorder (PTSD) symptoms. However, little is known about how these processes work together to shape PTG.

Aim: The current study examines the relationship between cumulative ACEs and PTG through meaning-making, resilience, and PTSD symptoms, in a comprehensive dynamic framework model using path modeling.

Method: A sample of 759 undergraduate psychology students (ages 18+) completed self-report measures through a 30-minute online survey that assessed their levels of ACEs, PTG, meaning-making, resilience, and PTSD symptoms. Path modeling inferential analyses were conducted in a cross-sectional study design.

Results: Findings revealed a significant direct pathway between cumulative ACEs and PTG, and two indirect pathways between cumulative ACEs and PTG that were negatively mediated by meaning-making and positively mediated by PTSD symptoms. However, resilience was not a significant mediator between cumulative ACEs and PTG. All pathways had a positive association except the associations between cumulative ACEs with meaning-making and with resilience.

Conclusion: Experiencing ACEs not only increases the likelihood of PTG in adulthood but this relationship is mediated by meaning-making and PTSD symptoms. This study shows that there is hope for growth for those individuals who experience ACEs and PTSD psychopathology post-ACEs by learning how to create meaning from an adverse event.

## Acknowledgments

I would like to extend my gratitude to my mentor, Dr. Paul Amrhein first and foremost for his kindness, support, and excellent leadership in guiding me every step of this process and for showing up whenever I needed it the most. I would also like to thank my dearest committee members, Dr. Jeremy Fox, Dr. Sarah Lowe, and Dr. Michael Bixter whose unflinching support, patience, expertise, and guidance helped me have a very positive experience completing my dissertation. Dr. Jeremy Fox's perfectionist and attention-to-detail feedback style helped me enhance the quality of my work and inspired me to aim for the highest standards in executing any work in life. Dr. Sarah Lowe's magical touch, statistical expertise, and kind feedback helped me approach any obstacles or problems I faced during this endeavor with ease and confidence. A special thank you to Dr. Michael Bixter for his saintly patience, foresightedness, and statistical expertise that gave me a great deal of confidence and comfort throughout this process.

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## **Introduction**

### **Trauma and Adverse Childhood Experiences (ACEs)**

Trauma is an emotional response to a profoundly stressful experience produced by human-made or natural adversities (American Psychological Association, 2020). Human-made traumatic events such as abuse, neglect, and household dysfunctions that are experienced in the first 18 years of life are called adverse childhood experiences (ACEs). The three primary ACE categories are further specified into subtypes accumulating a total of 10 ACEs. These include i) abuse (emotional, physical, sexual), ii) neglect (emotional, physical), and iii) household dysfunctions (parental separation, mother maltreatment, substance abuse, mental illness, criminal behavior) (Felitti et al., 1998; Felitti et al., 2019). What differentiates ACEs from other research terminologies such as childhood maltreatment, early adversity, or past trauma are that ACEs specifically focus on examining the three categories of human-made traumas – abuse, neglect, and household dysfunctions – with a focus on the time range of the first 18 years of life.

### **ACEs and Adult Health Risks**

Research on ACEs began in 1995 when a group of researchers sought to examine the relationship between childhood traumas and adult health in a group of approximately 14,000 adult participants enrolled in a San Diego Health Appraisal Clinic (Felitti et al., 1998). The study revealed a strong graded relationship between exposure to ACEs and increased health risks in adulthood including, physical ailments such as heart disease, lung disease, liver disease, cancer, etc., and mental health problems such as alcoholism, drug abuse, depression, and suicide. The researchers also found that the more ACEs a person experienced, the higher was their risk of experiencing both physical and mental health problems in adulthood (Felitti et al., 1998). Ample research thereafter has found that exposure to ACEs increases the likelihood of long-term,

negative mental health consequences such as post-traumatic stress disorder (PTSD), anxiety, depression, bipolar, psychosis, and suicide (Benarous et al., 2016; Björkenstam et al., 2016; Danese et al., 2009; Felitti, 2009; Giovanelli et al., 2016; Hughes et al., 2016; Ports et al., 2016).

### **Conceptualizing Post-Traumatic Growth (PTG)**

Despite the increased likelihood of experiencing psychopathology as a result of ACEs, deeply traumatizing experiences such as ACEs can sometimes be a catalyst for forming new adaptive schemas of the world and constructing new ways of living life that may contribute to a higher quality of life (Williamson, 2014). Positive psychological changes that go beyond previous levels of functioning, and occur after or as an outcome of a traumatic event is known as post-traumatic growth (PTG). This is a relatively new area of research investigation that focuses on examining the positive growth that a person experiences as a result of coping with an adverse event (Malhotra & Chebiyan, 2016; Rajandram et al., 2011; Tedeschi & Calhoun, 1996).

Research shows that individuals primarily experience five dimensions of growth after a traumatic event. The first growth involves “personal strength” where a person experiences a positive change in self-perception. For example, “I am stronger than ever and can tolerate situations better than I used to.” The second growth involves experiencing “new possibilities” where one discovers new choices regarding self and life. For example, “I developed new interests, and I am able to do better things with my life.” The third growth involves an enhanced “appreciation for life” where one becomes more grateful for the daily events in life. For example, “I can better appreciate each day and value my life more.” The fourth growth involves an enhanced ability to “relate to others” where one forms more meaningful and valuable interpersonal relationships. For example, “I am more willing to express my emotions and have a greater sense of closeness with others.” Lastly, the fifth growth involves spiritual/existential

change where one's beliefs, values, and goals in the world are strengthened and restructured as a result of experiencing adversity. For example, "I have a better understanding of spiritual matters, my higher purpose, and feel more connected to God." (Dursun & Soylemez, 2020; Tedeschi & Calhoun, 1996). Much research on PTG strives to capture these five dimensions of growth experienced by a person post-adversity (Malhotra & Chebiyan, 2016; Rajandram et al., 2011; Tedeschi & Calhoun, 1996).

Researchers are starting to explore PTG in the context of past trauma such as ACEs. In the next section, research examining the association between ACEs and PTG will be reviewed.

### **ACEs and PTG: Research Findings**

Research examining PTG in the context of ACEs highlights three main findings. First, studies have found a significant positive relationship between specific ACE subtypes (emotional abuse, physical abuse, sexual abuse, and neglect) and PTG (Cline, 2013; Easton et al., 2013; Mohr & Rosén, 2017). Second, studies have shown that specific ACE subtypes significantly impact PTG through a direct pathway (Easton et al., 2013; Mohr & Rosén, 2017). Third, all 10 ACEs or "cumulative" ACEs impact PTG through indirect pathways via probable mediators that include emotional resilience and foreshadow meaning-making (Tranter et al., 2021; Schaer, 2021; Yundt, 2021).

**ACEs and PTG: Direct Pathway.** Studies that have examined the association between ACE subtype/s and PTG have found a significant, direct, positive association between ACE subtype/s and PTG (Cline, 2013; Easton et al., 2013; Mohr & Rosén, 2017). In the following paragraphs, these studies will be elucidated.

The first study by Mohr and Rosen (2017) investigated PTG among college student survivors of childhood maltreatment. This study included a sample of 501 North American

college students (ages around 20 years old, 72% female, 79% Caucasians). The study revealed a significant positive association between four ACE subtypes (physical abuse, sexual abuse, emotional abuse, and neglect) and PTG in each of its five dimensions of growth.

The second study by Easton et al. (2013) investigated PTG among men with a history of childhood sexual abuse. Similar to Mohr & Rosén, (2017)'s study mentioned above, this study also included a large sample of 487 North-American participants (ages 19-84, 91% Caucasian) and all-male (100%). The study revealed a significant positive association between one ACE subtype (sexual abuse) and PTG. Thereby, supporting an important finding from Mohr & Rosén, (2017) and balancing this finding across gender. This study also foreshadowed a potential variable that may influence the relationship between the ACE subtype and PTG. This variable was the participants' "understanding" of childhood sexual abuse – similar to the concept of meaning-making (explained later in the meaning-making section below) – which was found to positively predict PTG.

Alternatively, a study by Cline (2013) examined the direct pathway between cumulative ACEs and PTG in 2319 combat-exposed soldiers (ages 18+, 61% female). This study did not examine specific ACE subtypes as the previous studies (Easton et al., 2013; Mohr & Rosén, 2017), and the findings revealed a non-significant, direct, positive relationship between cumulative ACEs and PTG. The study indicated that all 10 ACEs together did not significantly positively influence PTG through a direct pathway as ACE subtype/s in the previous studies did. This study indicated that even though participants who endorsed a greater number of ACEs reported greater PTG, there may be other factors in play for this relationship to reach significance in the context of cumulative ACEs.

Although the studies mentioned above have examined direct pathways between ACEs and PTG, support is needed for a significant direct pathway between cumulative ACEs and PTG, and for exploring factors such as meaning-making that may also dictate the relationship between the two. Next, studies examining the association between ACEs and PTG through indirect pathways will be elucidated.

**ACEs and PTG: Indirect Pathway.** Studies that have examined the association between cumulative ACEs and PTG have found a significant, indirect, positive association between cumulative ACEs and PTG (Tranter et al., 2021; Schaer, 2021; Yundt, 2021). In the following paragraphs, these studies will be explained.

A study by Tranter et al. (2021) examined the association between PTG and ACEs. It included a moderate sample size of 167 participants (ages 19-95, 55% female) from the United Kingdom (UK). The study revealed a significant positive association between cumulative ACEs and PTG in each of its five dimensions of growth. The study found that ACEs did not significantly influence PTG directly but worked indirectly through two important mediators which were, event centrality and emotional resilience. In this study, emotional resilience was described as dynamic personal characteristics of an individual that helped decrease the likelihood of post-trauma psychopathology, and event centrality was described as an event perceived to alter life trajectory in a significant way, which foreshadowed the concept of meaning-making.

Moreover, a study by Yundt (2021) also examined the association between PTG and cumulative ACEs in 235 North American participants (ages 25-34, 70% female, 81% Caucasian) and found similar findings as Tranter et al (2021) study where a significant indirect pathway was observed between cumulative ACEs and PTG mediated by emotional resilience. The study also

supported the finding of Cline's (2013) study mentioned above where cumulative ACEs and PTG did not have a significant, direct, positive association without this mediator.

Another study also supported these findings (Schaer, 2021). The researchers looked at the association between cumulative ACEs and PTG in 192 North American participants (ages 18+, 100% female, 78% Caucasian) and found a significant indirect pathway when cumulative ACEs were mediated by a third variable (disclosure support).

The studies above strongly support a significant indirect pathway between cumulative ACEs and PTG, emphasizing the importance of the role of the mediators. Without a mediator, this indirect pathway was not found to have a significant relationship as ACE subtype/s and PTG did. In other words, studies examining ACEs and PTG have shown that specific ACE subtype/s have a direct association with PTG, but cumulative ACEs only share a significant relationship with PTG in the presence of a third mediating variable.

Although the studies above support a significant indirect pathway between cumulative ACEs and PTG, these studies are very few, and more research is needed to support the association between cumulative ACEs and PTG through both direct and indirect pathways, specifically in the context of the two mediators, resilience and meaning-making. Lastly, even though concepts similar to meaning-making (event centrality, understanding ACE/s) have been explored as mediators between ACEs and PTG in the past, no study has examined meaning-making explicitly as a mediator between the two. These research gaps need to be addressed.

It might be hard to believe that there are only a handful of studies that have examined the relationship specifically between ACEs and PTG. This is because research in this area has mostly focused on exploring PTG in the context of past trauma/s, not specifically ACEs. Other

studies exploring PTG in the context of past trauma/s (not ACEs) will be briefly highlighted below.

**Other Findings.** Studies have examined PTG in the context of past trauma/s and may provide helpful insights towards ACEs and PTG research. The past traumas explored in these studies did not qualify as ACEs either due to the time frame of the reported trauma such as sexual abuse experiences reported by the participants were not limited to the first 18 years of their lives, or because the trauma type was not clearly reported or did not fall into any ACE category and merely looked at stressful life events in general (Arpawong et al., 2016; Lev-Wiesel et al., 2004). Regardless, these types of studies have commonly revealed that the more one experiences past trauma/s, the higher the likelihood of developing PTG. These findings buttress the positive relationship that was found between ACEs and PTG studies.

Moreover, some studies that did investigate similar PTG (e.g., psychological well-being) and ACE constructs (e.g., cumulative ACEs), examined them as predictors of other variables such as quality of life (Jiao-Mei, 2016) or attachment styles (Rumondor et al., 2018) and did not reveal findings specifically relevant to the relationship between ACEs and PTG. Thus, these studies could not be considered for ACEs and PTG research review.

In summary, based on the studies specifically exploring ACEs and PTG, research examining the association between them highlights three major findings. First, studies have found a significant positive relationship between specific ACE subtype/s and PTG, which means that the greater number of ACEs a person experiences, the higher the likelihood of experiencing PTG. Second, studies have shown that specific ACE subtype/s (not cumulative ACEs) impact PTG through a direct pathway, which means that specific ACEs (abuse and neglect) can directly influence the level of PTG achieved by an individual without the help of any mediators. Third,



cumulative ACEs impact PTG through indirect pathways via mediators that include emotional resilience and event centrality, the latter foreshadows meaning-making.

Further research is needed to assess and support whether a comprehensive framework of interactions exists between ACEs and PTG, where cumulative ACEs (not just specific ACE subtype/s) may impact PTG both directly and indirectly through probable mediators such as meaning-making and emotional resilience, which must be studied more explicitly. In the next sections, the concept of meaning-making (probable mediator) will be explained and its role in the relationship between ACEs and PTG will be reviewed.

### **Conceptualizing Meaning-Making**

Meaning-making has been suggested to play a pivotal role when encountering traumatic experiences (Park, 2013; Park; 2016). However, although meaning-making has gained much popularity, its research has been obstructed by conceptual limitations (Park 2010).

The concept of meaning-making was first introduced by Victor Frankl, a psychiatrist and holocaust survivor, who explicated this theory through his foundational works on Logotherapy (Frank, 1985). Meaning-making became part of the existential/phenomenological/humanistic schools of thought. Frankl proposed that an individual's primary motivation was to discover meaning in life as the creation of meaning gave one his life's purpose. Frankl suggested that understanding the meaning of a situation especially after experiencing a stressful event could help one make sense of the world and provide a stronger commitment to continue living one's life (Frankl, 1985; Park 2010; Park 2013).

Across studies, meaning-making has been theoretically conceptualized as either an intrinsic quality such as optimism, or learned skills such as, discovering one's purpose or linguistically constructing thematic coherence of a difficult situation (Gonzalez-Mendez et al.,

2018; Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019). Moreover, at an empirical/methodological level meaning-making has been differentiated and measured as two forms that include, “presence of meaning” or “search for meaning,” where the former indicates that meaning has been found, while the latter indicates that meaning has not been found and the person is still searching for it (Linley & Joseph, 2011; Triplett et al., 2012; Zeligman et al., 2019). Nonetheless, after carefully reviewing the meaning-making literature in the context of adversity, meaning-making can be defined as a subjective cognitive appraisal of a traumatic situation that is used to create a coherent narrative of one’s experience of the event that helps provide a sense of purpose post-adversity (Park, 2010).

In the next section, research on meaning-making (probable mediator) and its role in the relationship between ACEs and PTG will be reviewed.

### **ACEs, Meaning-Making, and PTG: Research Findings**

Research examining meaning-making and its relationship between ACEs and PTG highlight three main findings. First, studies have found a positive link between ACE subtypes (sexual abuse, mother maltreatment), meaning-making, and PTG, but are primarily qualitative (Anderson et al. 2011; Jirek et al., 2017). Second, a positive, but non-significant link has been found between past trauma/s such as physical abuse, sexual abuse, physical neglect, meaning-making, and PTG, not strictly ACEs (Mazor et al., 2018). Third, studies have found a positive, direct link between meaning-making and PTG in the context of past trauma/s, but not ACEs (Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019).

In the next section, both qualitative and quantitative studies examining these findings will be reviewed.

**ACEs, Meaning-Making, PTG: Qualitative Findings.** Research that has examined the association between ACEs and meaning-making is sparse and limited to two qualitative studies (Anderson et al. 2011; Jirek et al., 2017), which makes it difficult to validate the significance of their association quantitatively. Nonetheless, both studies hinted at a positive relationship between ACE subtypes (sexual abuse, mother maltreatment), meaning-making, and PTG (Anderson et al. 2011; Jirek et al., 2017).

The first study by Anderson et al. (2011) qualitatively explored PTG post-childhood adversity in adult daughters of battered women who were targeted by their intimate male partners (ACE subtype: mother maltreatment). The study included a small sample size of 15 women (ages 21-64, 100% female, 73% European American). A grounded theory method was used to analyze the meaning-making process. Results revealed that participants who were able to understand the cause and effect of the ACE subtype they experienced, and its significance in their life (meaning-making) reported experiencing PTG dimensions. The study revealed through qualitative analyses a positive relationship between ACE subtype (mother maltreatment) and meaning-making, and between meaning-making and PTG.

The second study by Jirek et al. (2017) qualitatively explored PTG in adult survivors of childhood trauma (ACE subtype: sexual abuse). The study included a small sample size of 46 young adults (ages 19-30; 61% female, 67% Caucasian) from a large North-American university. A thematic and structural narrative analyses method was used to analyze the meaning-making process. Results revealed that participants who were able to formulate a high narrative coherence (better meaning-making) also demonstrated high PTG. This study also revealed qualitatively a positive relationship between another ACE subtype (sexual abuse) and meaning-making. Thus,

this study also revealed through qualitative analyses a positive relationship between ACE subtype (sexual abuse) and meaning-making, and between meaning-making and PTG.

Based on these qualitative studies, it appears that certain ACE subtypes may help facilitate meaning-making in adulthood, which in turn might help with PTG. However, this association needs to be quantitatively examined across ACE subtypes and cumulative ACEs to meaning-making and PTG. The specific direction and magnitude with which these associations occur between these constructs remain vague until quantitatively tested. In the following paragraphs, quantitative studies examining these constructs will be explained.

**ACEs, Meaning-Making, PTG: Quantitative Findings.** Studies have examined the association between past traumas (not ACEs), meaning-making, and PTG through quantitative analyses. This first study found a positive, but non-significant link between specific past traumas (physical abuse, sexual abuse, physical neglect), meaning-making, and PTG (Mazor et al., 2018). However, other studies consistently found meaning-making as a positive, significant predictor of PTG in the context of past traumas (Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019). None of these studies examined ACEs.

This first study (Mazor et al., 2018) examined meaning-making as a mediator of PTG in a clinical sample of severely mentally ill patients (specifically psychosis) who recalled past traumas (physical abuse, sexual abuse, physical neglect) not limited to the first 18 years of life to be qualified as ACEs. The study included a moderate sample size of 121 severely mentally ill patients with psychosis (ages 32-55, 54% female) from Israel. The findings revealed that meaning-making positively but non-significantly mediated the relationship between past trauma and PTG. The study explained that the non-significant finding may be specific to the unique

sample of this study that consisted of psychosis patients who may not have had the ability or skill to create coherent meaning from their past traumas.

This finding could also be justified by a review by Bonanno (2013) where meaning-making was proposed to be a multifaceted phenomenon whose impact depends on several factors. These factors include the context in which meaning-making is being used (e.g., psychosis versus non-psychosis population), how receptive the audience is to creating meaning from their adversity, the cultural beliefs and expectations, the age and gender of the individual, and the duration between the traumatic event and the time when meaning is made. Therefore, more research is needed to understand the nuances of how meaning-making works with PTG, more strictly in the context of ACEs within different types of populations.

In contrast to the Mazor et al., (2018) findings, three more quantitative studies consistently found meaning-making as a positive, significant predictor of PTG in the context of past traumas, but these studies also did not explore this association in the context of ACEs (Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019).

The study by Zeligman et al. (2019) examined meaning-making (i.e., presence and search) as a predictor of PTG in survivors of past trauma (similar to ACE categories: abuse and household dysfunctions). The study included a large sample size of 221 adults (ages 18+, 67% female, 42% black) from a multiracial, urban, North-American university. The study revealed that both presence and search for meaning significantly positively predicted PTG. The authors suggested that the presence and search for meaning were vital cognitive processes in finding meaning that eventually led to experiencing PTG in the context of past trauma.

Similarly, the study by Zheng et al. (2019) also examined meaning-making as a predictor of PTG in survivors of past trauma. This study included a small sample size of 52 participants

(ages 18+, 67% female) from a university in China. The study revealed that the presence of meaning was a significant positive predictor of PTG, especially for those who created a coherent narrative of their past traumas (similar to ACEs: abuse, neglect, and household dysfunctions).

Finally, the study by Waters et al. (2013), in which the impact of meaning-making on PTG post-trauma was examined also found meaning-making as a significant positive predictor of PTG. This study included a large sample of 225 participants (ages 18+, 48% female, 67% Caucasian) from a North-American university who responded in the context of the memories of their past traumas (similar to ACEs: abuse, neglect, and household dysfunctions).

Although the above three studies have consistently shown that meaning-making is a positive predictor of PTG (Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019), it is important to note that these studies did not strictly examine ACEs.

In summary, based on the studies above, research examining meaning-making and its relationship between ACEs and PTG highlights three major findings. First, studies have found a positive link between ACE subtypes (sexual abuse, mother maltreatment), meaning-making, and PTG, which shows that people who indulge in meaning-making also increase their likelihood of experiencing PTG after experiencing childhood sexual abuse or mother maltreatment. However, these studies are primarily qualitative and only examine two specific ACE subtypes.

Second, a positive, but non-significant quantitative link was found between specific past traumas similar to ACEs (physical abuse, sexual abuse, physical neglect), meaning-making, and PTG, but not ACEs, as the past traumas were experienced beyond the first 18 years of life. Moreover, these findings presented were specific to the psychosis sample (Mazor et al., 2018). Finally, other quantitative studies that did find a positive, direct link between meaning-making and PTG did so in the context of past traumas, but not ACEs (Waters et al., 2013; Zeligman et

al., 2019; Zheng et al., 2019). Further research is needed where meaning-making should be examined as a probable mediator between ACEs and PTG, in the context of cumulative ACEs and not past trauma/s.

In the next section, the concept of emotional resilience (probable mediator) will be explained and its role in the relationship between ACEs and PTG will be reviewed.

### **Conceptualizing Emotional Resilience**

Resilience has been conceptualized in different ways over the years amid the evolution of a multidisciplinary approach to understanding it (Almedom & Glandon, 2007; Oshri et al., 2020). Specifically, resilience has been explained as a process, an outcome, a steady-state post-adversity, or defiance of vulnerability post-adversity (Almedom & Glandon, 2007).

More recently, researchers have reached a consensus specifically in the context of trauma research that conceptualizes resilience as a dynamic process consisting of personal and situational factors that help an individual adaptively function in the aftermath of adversity with a decreased likelihood of experiencing post-trauma psychopathology (Bonanno, 2005; Lee et al., 2020; Oshri et al., 2020; Tranter et al., 2021). It is also important to note that the main distinction between PTG and resilience is that, resilience focuses on the “successful adaptation” of an individual to the situation after a traumatic event, whereas PTG focuses on “explicit dimensions of growth” that individuals experience after a traumatic event (Dykes, 2016; Oshri et al., 2020).

In the next sections, research on resilience (probable mediator) and its role in the relationship between ACEs and PTG will be reviewed.

### **ACEs, Resilience, and PTG: Research Findings**

Research examining resilience and its relationship between ACEs and PTG highlights three main findings. First, studies have found both positive and negative relationships between ACEs and resilience (Chen et al., 2021; Dykes, 2016; Pasha-Zaidi et al., 2020; Yund, 2021) and between resilience and PTG (Chen et al., 2021; Lee et al., 2020; Tranter et al., 2021; Weber, 2021; Yund, 2021) showing a pattern of mixed findings. Second, studies indicate stronger evidence of a negative association between ACE subtypes (abuse and neglect), cumulative ACEs, and resilience (Chen et al., 2021; Pasha-Zaidi et al., 2020; Yund, 2021). Third, studies indicate stronger evidence of a positive association between resilience and PTG (Chen et al., 2021; Lee et al., 2020; Yund, 2021). In the following paragraphs, these studies will be explained.

**ACEs and Resilience: Research Findings.** A study by Chen et al., (2021) investigated the relationship between specific ACE subtypes (abuse and neglect) and resilience among 2229 university students based in China (ages 18+, 67% female) and found a significant negative association between the ACE subtypes and resilience. The study also revealed a gender difference in this finding, where female participants demonstrated a significant association in this finding but male participants did not. Moreover, a study by Yund (2021) that was previously described under the ACEs and PTG section, also revealed a significant negative association between cumulative ACEs and adult resilience.

Another study by Pasha-Zaidi et al. (2020) investigated the relationship between cumulative ACEs and resilience among 124 undergraduate college students in Turkey (ages 18-25; 67% female) and found a negative association between cumulative ACEs and adult resilience but this outcome did not reach significance.



The above studies show that ACEs have a negative association with resilience. However, this outcome only reaches significance in some contexts of ACE subtypes or cumulative ACEs. In future research, it would be worth examining and clarifying if cumulative ACEs do reach a statistically significant negative relationship with resilience.

On the other hand, only one study (Dykes, 2016) showed a positive association between ACEs and resilience. However, this study was qualitative, therefore this finding remains to be quantitatively validated. The study was conducted by Dykes (2016) who investigated the relationship between ACEs and resilience using a qualitative research design of thematic analyses in a sample of 10 social work undergraduate students based in South Africa. The findings revealed that students who had endured ACEs developed resilience. However, due to the qualitative nature of this study and the use of a small sample, it is difficult to state the actual levels to which resilience was enhanced, and whether these findings can be translated to a larger global population.

Next, studies examining the association between resilience and PTG in the context of ACEs will be elucidated.

**Resilience and PTG: Research Findings.** The study by Chen et al. (2021) mentioned above found a significant positive association between resilience and PTG. These results were buttressed by Yund's (2021) study also mentioned above, where a significant positive association was found between resilience and PTG.

Moreover, another study by Lee et al. (2012) who examined the relationship between resilience and PTG in the context of cumulative ACEs in a sample of 143 adult participants (ages 18+; 57% female) based in Korea also found a significant positive association between resilience and PTG but one that was moderated by higher levels of childhood trauma. In other words,

experiencing greater childhood trauma, enabled greater levels of resilience to be associated with greater levels of PTG.

It is important to note that all three studies above support the positive relationship between resilience and PTG in the context of ACE subtypes and cumulative ACEs. Nevertheless, some studies (Tranter et al., 2021; Weber, 2021) have presented contradictory findings.

For example, the study by Tranter et al. (2021) mentioned previously under the ACEs and PTG section, where emotional resilience was found to be a mediator between cumulative ACEs and PTG. This study demonstrated a medium negative effect, where individuals who were lower in resilience were more likely to experience PTG.

Moreover, a recent study by Weber (2021) also supported a similar finding in a sample of 628 university students based in the southeastern United States (ages 18+, 71% female, 77% Caucasian) who obtained a non-significant negative association between their resilience and PTG scores in the context of cumulative ACEs.

Both the studies indicated a negative association between resilience and PTG scores and shared that this may have been due to lower exposure to ACEs, and the presence of third predictor variables such as meaning-making and PTSD symptoms that worked as significant positive (meaning-making) and negative (PTSD symptoms) predictors of resilience which in turn shared their relationship with PTG. However, the dynamic interaction of these constructs has not been studied yet in the context of ACEs and PTG research. Further research is needed to address this limitation.

In summary, based on the studies above, research examining resilience and its relationship between ACEs and PTG highlights two predominant findings. First, studies indicate stronger evidence of a negative association between ACE subtypes (abuse and neglect),

cumulative ACEs, and resilience, which means that higher exposure to ACEs associated with a lower likelihood of resilience. Second, studies indicate stronger evidence of a positive association between resilience and PTG, which means that the more resilient one is, the more likelihood of experiencing PTG. However, due to the nature of mixed contradictory findings across both these predominant patterns, more research is needed to clarify or support these findings. Moreover, the dynamic interaction between all three constructs: resilience, meaning-making, and PTSD symptoms is yet to be examined in the context of ACEs and PTG.

In the next section, the PTSD psychopathology (probable mediator) will be explained and its role in the relationship between ACEs and PTG will be reviewed.

### **Conceptualizing PTSD**

One disorder that has shown to have a concrete relationship with ACEs is adult PTSD. It is a severe and chronic mental health problem that develops over time due to a person's inability to cope with one or more ACEs (American Psychiatric Association, 2013; Brockie et al., 2015; Frewen et al., 2019; Schalinski et al., 2016). According to the Diagnostic and Statistical Manual of Mental Disorders, version five, PTSD can be characterized by four primary symptomologies, i) re-experiencing the event/intrusion symptoms, e.g. flashbacks, distressing memories, or dreams; ii) avoidance of event stimuli, e.g. staying away from objects, persons, thoughts or feelings that are reminders of the event; iii) negative alterations to cognitions, mood, or emotions, e.g. distorted thoughts or feelings, or apathy; and iv) hyperarousal to reminders of the event, e.g. heightened reflexes, startle responses, or angry outbursts (DSM-5; American psychiatric association, 2013).

A recent study by Frewen et al. (2019) that explored the relationship between ACEs and adult PTSD found that ACEs uniquely predicted all four symptom categories of the DSM-5

diagnosis of PTSD: re-experiencing the event, avoidance, negative alterations in cognition/emotion, and hyperarousal (DSM-5; American Psychiatric Association, 2013).

In the next section, the research on PTSD symptoms (probable mediator) will be explained and its role in the relationship between ACEs and PTG will be reviewed.

### **ACEs, Adult PTSD Symptoms, and PTG: Research Findings**

Research examining adult PTSD symptoms and their relationship between ACEs and PTG highlights two main findings. First, ample research on ACEs and their impact on future psychopathologies shows a clear and direct positive association between ACEs and PTSD in adulthood (Brockie et al., 2015; Frewen et al., 2019; Schalinski et al., 2016). Second, studies have revealed mixed findings between adult PTSD symptoms and PTG, where a positive link between PTSD and PTG has been found in the context of specific ACE subtypes (physical & sexual abuse; Boals & Schuettler, 2011; Shakespeare-Finch & Lurie-Beck, 2014), and a curvilinear relationship between PTSD symptoms and PTG has been found in the context of past trauma, not ACEs (Kleim & Ehlers, 2009). In the following paragraphs, the above-mentioned studies will be elucidated.

**ACEs and Adult PTSD Symptoms: Research Findings.** The study by Frewen et al. (2019) mentioned above investigated the association between cumulative ACEs and PTSD symptoms among 418 North-American adult participants. (ages 18+, 52% female; 53% Caucasian). The study revealed that cumulative ACEs uniquely predicted all four primary symptom categories of the DSM-5 diagnosis of PTSD, which included re-experiencing the event, avoidance, negative alterations in cognition/emotion, and hyperarousal.

Studies exploring ACEs and PTSD also examined the influence of specific ACE subtypes, not just cumulative ACEs.

A study by Brockie et al (2015) investigated the relationship between six ACE subtypes (emotional, physical, sexual abuse; emotional, physical neglect, mother maltreatment) and PTSD symptoms among 288 Native American participants (ages 18+, 51% female). The study found that all six ACE subtypes uniquely contributed to an increased likelihood of PTSD symptoms.

Moreover, another study by Schalinski et al (2016) examined how ACEs differentially affected PTSD symptom severity. The study included 129 adult inpatients (ages 18+, 50% female) based in Germany. The study revealed that PTSD symptoms were best predicted by cumulative ACEs, and ACE subtypes such as emotional and physical neglect more strongly predicted PTSD-related symptoms of dissociation.

Overall, the studies above provide strong evidence for a direct positive association between cumulative ACEs, ACEs subtypes (emotional, physical, sexual abuse; emotional, physical neglect, mother maltreatment), and adult PTSD symptoms.

Next, studies examining the association between adult PTSD symptoms and PTG in the context of ACEs and past trauma will be elucidated.

**Adult PTSD Symptoms and PTG: Research Findings.** A study conducted by Boals & Schuettler (2011) investigated the association between adult PTSD symptoms and PTG in the context of two ACE subtypes (physical and sexual abuse). The study included a sample of 603 north-American students (ages 18-60, 65% female, 59% Caucasian). The study found a positive association between ACEs, PTSD, and PTG, and explained this finding through the concept of event centrality (meaning-making). In other words, the more the participants construed their traumatic experiences as central to their identity and development, the greater was the likelihood of both PTSD symptoms and PTG.

In contrast, a study by Kleim & Ehlers (2009) who investigated the relationship between adult PTSD symptoms and PTG in survivors of past trauma (assault), not ACEs, found a curvilinear relationship between PTSD symptoms and PTG explaining that an optimal level of PTSD is important to facilitate PTG. The explanation was that an optimal level of PTSD allows sufficient cognitive power to contemplate one's life to generate PTG. Going outside the optimal level into severe levels of PTSD symptomology may produce a cognitive overload to induce a negative association between PTSD symptoms and PTG. This is an important observation explaining the curvilinear nature of PTSD symptoms and PTG.

However, given that the Kleim & Ehlers (2009) study did not focus strictly on ACEs lends little validity to the curvilinear nature between adult PTSD symptoms and PTG in the context of ACEs. There is more support for a positive association between adult PTSD symptoms and PTG as highlighted in Boals & Schuettler's (2011) study. Moreover, a meta-analytic clarification of this relationship has also demonstrated leanings towards linear, direct, positive association between adult PTSD and PTG (Shakespeare-Finch & Lurie-Beck, 2014).

Since studies have shown mixed findings regarding the relationship between adult PTSD symptoms and PTG, and have not specifically studied this association in the context of cumulative ACEs, additional research is needed to clarify this association in ACEs context.

In summary, based on the studies above, research examining adult PTSD symptoms and their relationship between ACEs and PTG highlights two main findings. First, ACEs (both cumulative and subtypes) and PTSD symptoms in adulthood have a positive association with each other, which means that the higher the ACEs one experiences, the higher the likelihood of experiencing PTSD symptoms. Second, although scarce, studies that examined the relationship between adult PTSD symptoms and PTG, show leaning towards a positive relationship between

the two, which means that past traumatic events can increase the likelihood of both PTSD symptoms and also PTG. However, this finding is only in the context of specific ACE subtypes such as physical and sexual abuse. Further research is needed to buttress this finding in the context of cumulative ACEs.

### **Putting it all Together: Goals of the Present Study**

Despite ample support emphasizing the relationship between ACEs and adult psychopathology, research between ACEs and PTG is limited and the role of probable mediators such as meaning-making, emotional resilience, and PTSD symptoms must be explored in a dynamic framework model.

Studies examining the relationship between ACEs and PTG have indicated both direct and indirect pathways between the two. Studies have shown that ACE subtypes work through direct pathways with PTG, but cumulative ACEs require the presence of mediators to establish a relationship with PTG. Moreover, probable mediators such as meaning-making, resilience, and PTSD symptoms have presented their challenges such as conceptual limitations in the former two constructs and mixed findings in their relationship with ACEs and PTG for the latter two constructs.

More specifically, this study builds on existing research by: a) providing the first path model analyses that examine these five constructs through a dynamic framework model, b) examining if cumulative ACEs share a direct relationship with PTG, and if cumulative ACEs share an indirect relationship with PTG through all three probable mediators, c) examining the role of meaning-making between ACEs and PTG, specifically in the context of cumulative ACEs and not just past trauma, d) clarifying the role of emotional resilience between ACEs and PTG to

buttress the predominant research findings, e) clarifying the role of PTSD symptoms between ACEs and PTG to support the predominant research findings.

### **The Current Study: Rationale, Aims, and Hypotheses**

Investigating PTG in the context of ACEs is key to recognizing whether and how growth is possible after traumatic childhood experiences and what mechanisms mediate this growth. Based on prior research, associations have been found between ACEs and PTG and several factors that potentially mediate this relationship, including meaning-making, resilience, and PTSD symptoms. However, no research to date has investigated the relationship among these five constructs nor examined a potential, coherent framework through which all ten/cumulative ACEs impact PTG. Examining these relationships in a coherent framework would help us better understand how cumulative ACEs impact PTG directly and indirectly via meaning-making, resilience, and PTSD symptom mediators.

The current study aims to explore the relationship between cumulative ACEs and PTG through three potential mediators, meaning-making, resilience, and PTSD symptoms in a dynamic framework model, using path modeling. Based on the preceding literature review, five hypotheses are proposed (Figure 1):

Hypothesis 1: Cumulative ACEs will share a significant positive association with PTG through a direct pathway.

Hypothesis 2: Cumulative ACEs will share a significant association with PTG through all three indirect pathways that include meaning-making, emotional resilience, and PTSD symptom mediators.



Hypothesis 3: Cumulative ACEs will share a significant positive association with meaning-making and meaning-making will share a significant positive association with PTG through an indirect pathway.

Hypothesis 4: Cumulative ACEs will share a significant negative association with resilience and resilience will share a significant positive association with PTG through an indirect pathway.

Hypothesis 5: Cumulative ACEs will share a significant positive association with PTSD symptoms and PTSD symptoms will share a significant positive association with PTG through an indirect pathway.

## **Methods**

### **Participants and Procedure**

This study was approved by Montclair State University's Institutional Review Board. A total of 759 undergraduate students above 18 years old and with college-level English reading and comprehension skills were randomly recruited through a campus-wide email blast. The participants provided written informed consent and were given approximately 30 minutes to complete an online Qualtrics survey, which consisted of six primary measures including a demographics sheet. At the end of the study, the participants received a debriefing letter and entered a raffle draw to win \$50 Amazon Gift Cards as compensation for completing the study.

### **Measures**

**Demographics Information Sheet.** Participants were asked to provide information about their age, gender, ethnicity, socioeconomic status, level of education, employment status, relationship status, geographic status, past and current mental health history, social support

status, meaning-making receptivity, and the timing of meaning-making post-adversity. These demographic variables were used as controls and to compare outcomes across participants.

**Adverse Childhood Experiences Questionnaire (ACEs Questionnaire; Felitti et al., 1998).** Participants were asked to complete a 10-item self-report measure that assessed all ten ACEs in the first 18 years of their life. Items captured three broad ACEs (abuse, neglect, and household dysfunction) and a total of ten subtypes (*abuse* - emotional, physical, sexual; *neglect* - emotional, physical, and *household dysfunctions* - parental separation, mother maltreatment, substance abuse, mental illness, criminal behavior). Participants answered “yes” or “no” to each ACE subtype (e.g., “*Did a parent or other adult in the household often ...Swear at you, insult you, put you down, or humiliate you? Or act in a way that made you afraid that you might be physically hurt?*”). Each yes was scored at 1 point for a total possible score of 10-points. This measure has demonstrated excellent psychometric properties such as Kappa = .59, intra-class correlation = .88, and concurrent validity (Banerous et al., 2017). Cronbach’s alpha of internal consistency in the current study was .71.

**Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996).** Participants were asked to complete a 21-item self-report measure rating the degree to which changes occurred in their life as a result of ACE/s on a scale of 0 (e.g., “*I did not experience this change as a result of my crisis*”) to 5 (e.g., “*I experienced this change to a very great degree as a result of my crisis*”). Items capture five dimensions of growth that included, I: Relating to Others (e.g., “*I have a greater sense of closeness with others*”), II: New Possibilities (e.g., “*I developed new interests*”), III: Personal Strength (e.g., “*I have a greater feeling of self-reliance*”), IV: Spiritual Change (e.g., “*I have a better understanding of spiritual matters*”), and V: Appreciation of Life (e.g., “*I can better appreciate each day*”). The responses were scored out of 105 total points for

all 21-items, and the individual dimension scores were calculated by adding the responses for items belonging to each dimension of growth. This measure has demonstrated good reliability and validity (Tedeschi & Calhoun, 1996). Cronbach's alpha of internal consistency in the current study was .94.

**Meaning-Making Questionnaire (MLQ; Steger et al., 2006).** Participants were asked to complete a 10-item self-report measure that assessed the presence of meaning (five total items; e.g., *"I understand my life's meaning"*) and search for meaning (five total items; e.g., *"I am always looking to find my life's purpose"*) in their lives as a result of ACEs on a scale of 1 (Absolutely Untrue) to 7 (Absolutely True). The responses were scored out of 35 total points for the presence of meaning, and 35 total points for search for meaning. This measure has demonstrated good reliability and validity (Steger et al., 2006). Cronbach's alpha of internal consistency in the current study was .76.

**Brief Resilience Scale (BRS; Smith et al., 2008).** Participants were asked to complete a 6-item self-report measure to assess resilience and their ability to bounce back (e.g., *"I tend to bounce back quickly after hard times"*) on a scale of 0 (Strongly Disagree) to 5 (Strongly Agree). The responses were scored out of a total of 30 points, and individual responses were added and averaged by the total number of statements answered. This measure has demonstrated good reliability and validity (Smith et al., 2008). Cronbach's alpha of internal consistency in the current study was .86.

**PTSD Checklist for DSM-5 (PCL-5; Blevins et al., 2015).** Participants were asked to complete a 20-item self-report measure that assessed 20 DSM-5 symptoms of PTSD in the past month (e.g., *"In the past month, how much were you bothered by...1. Repeated, disturbing, and unwanted memories of the stressful experience?"*) on a scale of 0 (Not at all) to 5 (Extremely).

The responses were scored out of a total of 80 points. This measure has demonstrated strong reliability and validity (Blevins et al., 2015). Cronbach's alpha of internal consistency in the current study was .94.

### **Data Analysis**

The analysis was completed in three stages. First, preliminary analyses of the data were conducted, which included an evaluation of missing data, examining descriptives such as means, standard deviations, conducting bivariate correlations for key study variables of the hypothesized model, and assumption testing for normal distribution. The SPSS software (Version 27.0; IBM Corp., 2020) was used to conduct these analyses.

Second, inferential analyses of the data were conducted using path modeling to test the seven paths of the hypothesized model (Figure 2). The hypothesized model was specified to examine the impact of ACEs (exogenous variable) on PTG through meaning-making, resilience, and PTSD symptoms (endogenous variables). The model also controlled for all demographic variables (covariates). The analyses specified, fit, estimated, and ran the model to obtain coefficient estimates,  $R^2$  values, and fit measures. At this phase, the full information likelihood estimation (FIML) was also used to handle any missing data to prevent listwise deletion, and robust maximum likelihood estimation (MLR) was used to adjust for normality assumption violations (Irizarry, 2019; Kline, 2015). The Chi-square test of significance ( $\chi^2$ ) was examined, and the model's goodness-of-fit was assessed using the Comparative Fit Index (CFI), the root-mean-square error of approximation (RMSEA), and standardized root mean square residual (SRMR) (Hu & Bentler, 1999). Following the guidelines, the selected cutoffs for acceptable model fit were CFI values above 0.90 ( $CFI > .90$ ), and the RMSEA and SRMR values less than

0.08 (RMSEA/SRMR < .08) (Hu & Bentler, 1999; Kline, 2015). Other estimates such as standard errors and significance values for the model were also obtained.

Third, the indirect effects of ACEs on PTG via meaning-making, resilience, and PTSD symptoms were examined using 5000 bootstrapped samples with 95% bias-corrected confidence intervals (CI), and parameter estimates were calculated. The 95% CI estimates that did not contain a 0 were counted as statistically significant indirect paths (Preacher & Hayes, 2008). The RStudio software with the MVN package (Version 1.1.463; RStudio Team., 2020) was used for conducting the Mardia test for multivariate normality assumption, and the Lavaan package was used for running the path model.

## Results

### Preliminary Analyses

Prior to conducting the main analyses, the normality of all the key study variables was examined (ACEs, PTG, meaning-making, resilience, PTSD symptoms) using a Shapiro Wilk test of significance. Only PTG and adult PTSD symptoms violated the normality assumption ( $p < .05$ ). Both these variables were positively skewed. To correct this violation, the maximum likelihood estimation with robust standard errors (MLR) function was used in the R script when running the path models for the main analyses.

**Demographic analyses.** Table 1 lists the descriptive demographics for the 759 participants in the analytic sample. As shown, the average age of the participants was 23.15 years ( $SD = 6.81$ ) at the time of the completion of the study. Most participants identified as female (82.36%), Caucasian (44.93%), students (48.0%) who belonged to the middle-class SES category (69.44%), were completing post-high school education (88.8%), were single (54%), and resided

in the USA (99.34%) with a select few who resided in other countries such as Bangladesh, Egypt, Germany, Palestine, and Thailand (0.66%).

Most participants also reported personal experience with past or current mental health problems (58.1%) that ranged from attention deficit hyperactivity disorder (ADHD), anorexia, anxiety, autism, borderline, bipolar, depression, obsessive-compulsive, post-traumatic stress, schizoaffective, and substance use disorders. The majority of the participants also shared that they had a strong social support system (81.10%), were thinking about or receptive to the idea of finding meaning from their ACE/s experiences (80.73%), with a maximum number of participants indicating that they found meaning from their ACE/s experiences several years after the ACE/s occurrence (64.65%). The participants' responses also indicated that out of those who reported an ACE (73.6%) experienced an average of two to four ACEs ( $M = 2.75$ ,  $SD = 2.24$ ) in their past.

Lastly, the distribution of all ACEs, meaning-making, and PTG subcomponents was found (Table 21) where majority of participants indicated Emotional Abuse (38.3%) as their ACE and minority of participants indicated experiencing criminal behavior in the household (6.6%). Majority of participants indicated experiencing the PTG subcomponent of spiritual enrichment (64.4%) and a minority of participants indicated experiencing the PTG subcomponent of appreciation for life (63.2%). Although, there was not much of a distribution difference between the latter two. Similarly, participants also indicated almost equal levels of meaning-making subcomponents, presence of meaning (62.5%) and search for meaning (62.6%).

**Bivariate analyses.** Table 2 shows the bivariate correlations between the key study variables and their subcomponents. There was a statistically significant positive correlation between cumulative ACEs and PTG. Meaning-making showed a statistically significant negative

correlation with cumulative ACEs and a statistically significant positive correlation with PTG. Resilience showed a negative correlation with cumulative ACEs but this was not statistically significant, and resilience showed a statistically significant positive correlation with PTG. Lastly, PTSD symptoms showed a statistically significant positive correlation with cumulative ACEs and a statistically significant positive correlation with PTG. Overall, all three hypothesized mediator variables (meaning-making, resilience, and PTSD symptoms) were statistically significantly correlated with cumulative ACEs except resilience, and all three hypothesized mediator variables were statistically significantly positively correlated with PTG.

Moreover, amongst the three hypothesized mediators, the correlation between meaning-making and resilience was positive and statistically significant, and the correlations between meaning-making and PTSD symptoms and between resilience and PTSD symptoms were negative and statistically significant.

Among the subcomponents of PTG (personal strength, new possibilities, appreciation for life, relating to others, and spiritual enrichment), cumulative ACEs showed statistically significant positive correlations with only three out of five subcomponents that included personal strength, new possibilities, and appreciation for life. All five subcomponents were statistically significantly positively correlated with PTG and meaning-making. Between the five subcomponents, each of them was statistically significantly positively correlated with the other. Furthermore, the first and fifth subcomponents, personal strength and spiritual enrichment were statistically significantly positively correlated with meaning-making and resilience, but not PTSD symptoms. The second and third subcomponents, new possibilities and appreciation for life were statistically significantly positively correlated with meaning-making, resilience, and

PTSD symptoms. The fourth subcomponent, relating to others was statistically significantly positively correlated with only meaning-making, but not resilience and PTSD symptoms.

Among the subcomponents of meaning-making (presence and search), cumulative ACEs showed statistically significant correlations with both forms of meaning-making, showing a negative correlation with presence of meaning and a positive correlation with search for meaning. Both presence and search for meaning were also statistically significantly positively correlated with PTG, all five subcomponents of PTG, as well as resilience. Moreover, both presence and search for meaning showed statistically significant correlations with PTSD symptoms, where PTSD symptoms shared a negative correlation with presence of meaning and a positive correlation with search for meaning. Lastly, between the subcomponents, presence of meaning showed a statistically significant negative correlation with search for meaning.

All statistically significant correlations for the key study variables were within the low to moderate range ( $<.50$ ) and there was no indication of multicollinearity ( $>.80$ ).

**Missing Data Analyses.** A univariate missing data analysis showed that the survey was completed by all 759 participants (100%) of the analytic sample. However, the demographic variables and the key study variables had 20-30% missing values for the individual responses which were above the recommended cutoff ( $>10\%$ ). To address this, the full information likelihood estimation (FIML) was used before running the path models for the main analyses.

Moreover, the MCAR test was run across all scales accounting for demographic variables/covariates to assess whether participants' responses were missing completely at random. Cumulative ACEs (.974), PTG (.112), meaning-making (.266), and PTSD symptoms' (.918) items showed responses that were random and non-significant in missingness ( $p>.05$ ). In other words, the missingness across the key study variables was random and not influenced by



any particular covariate. Only the resilience scale (.001) showed a significant value in missingness ( $p < .05$ ). To address this, separate analyses were run to diagnose what determined the non-random missingness in resilience and if any of the covariates were responsible for this. A new resilience binary variable (RESBINARY) where 1 = all who responded, and 0 = all who did not respond was created. Next, using SPSS, Data, Split File option – frequencies, descriptives, and independent t-tests were run on the new RESBINARY variable. It was found that none of the covariates significantly influenced the non-random missingness in the resilience scale.

However, a pattern in the missing data between ACEs responses and resilience responses was found. Some of the participants who completed the ACEs scale did not attempt the resilience scale ( $n = 290$ ). A total of 306 out of the original 759 cases were deleted for participants that did indicate any response or indicated a 0 ACEs cumulative score. A total of 157 cases were deleted where both ACEs and resilience responses were left blank. Using a simple t-test analysis, a significant difference was found between ACEs scores for those who completed the resilience items ( $n = 461$ ) versus those who did not ( $n = 98$ ),  $t(557) = -3.09$ ,  $p < .05$ . Counterintuitively, those who got higher scores on the ACEs scale (98.3%) were more likely to do the resilience scale versus those who did not (73.7%). Thus, in our final path model analyses, since the missingness was random across the key variables and not determined by a specific covariate, we did not need to control for covariates. Nonetheless, for best practices, we controlled for all our covariates (age, gender/GD, ethnicity/ED, ses/SD, education/EDD, employment/EMPD, relationship status/RD, current mental health/MHD, social support/SSD, meaning-making receptivity/MRD, meaning-making timing/MTD) whose categories were converted to binary variables, and this yielded similar outcomes as not controlling for covariates. The covariates predicted for all endogenous variables.

## Main Analyses

Each of the seven paths of the hypothesized model (Figure 1) was examined using path modeling. One direct pathway between cumulative ACEs and PTG and three indirect pathways involving meaning-making, resilience, and PTSD symptoms as the hypothesized mediators between cumulative ACEs and PTG were examined (Figure 2).

**Full Model.** This model was just identified which means that the model fit was necessarily perfect,  $\chi^2(0, N=428) = .00, p = .00, CFI = 1.00, RMSEA = 0.00, 90\% CI = .00-.00, SRMR = .00$ . The covariances between the mediator variables were also added. All the hypothesized paths reached statistical significance (Figure 3), except the path from cumulative ACEs to resilience (path 4). Cumulative ACEs had significant direct effects on PTG,  $\beta = .12, p = .007$  (path 1), meaning-making,  $\beta = -.18, p < .001$  (path 2), and PTSD symptoms,  $\beta = .47, p < .001$  (path 6). However, cumulative ACEs did not have a significant direct effect on resilience,  $\beta = -.03, p = .57$  (path 4). In turn, meaning-making had a significant direct effect on PTG,  $\beta = .43, p < .001$  (path 3), resilience had a significant direct effect on PTG,  $\beta = .22, p < .001$  (path 5), and PTSD symptoms had a significant direct effect on PTG,  $\beta = .19, p < .001$  (path 7). In total, the model explained the following variances in meaning-making (3.1%), resilience (0.1%), PTSD symptoms (22.4%), and PTG (25.4%).

**Analyses of Indirect Effects.** Indirect effects from cumulative ACEs to PTG were assessed in the full model through three hypothesized mediators (meaning-making, resilience, and PTSD symptoms). Table 3 shows the unstandardized coefficient estimates and 95% confidence intervals for the full model. Using 5000 bootstrapped samples with 95% bias-corrected CI showed that two indirect pathways that involved meaning-making (paths 2 and 3) and PTSD symptoms (paths 6 and 7) significantly mediated the association between cumulative

ACEs and PTG (Figures 2 and 3). In other words, cumulative ACEs influenced PTG through meaning-making (cumulative ACEs → meaning-making → PTG) and cumulative ACEs influenced PTG through PTSD symptoms (cumulative ACEs → PTSD symptoms → PTG). Resilience was not found to mediate the pathway from cumulative ACEs to PTG.

**Hypotheses Testing.** Based on the results from the full model, two out of the five hypotheses were fully supported (hypotheses 1 and 5) and three out of the five hypotheses were partially supported (hypotheses 2, 3, 4).

Hypothesis 1 predicted that cumulative ACEs would share a significant positive association with PTG through a direct pathway. A significant direct positive association was found between the two (Figure 3). Hence, hypothesis 1 was fully supported.

Hypothesis 5 predicted that cumulative ACEs would share a significant positive association with PTSD symptoms and PTSD symptoms would share a significant positive association with PTG through an indirect pathway. A significant indirect pathway between cumulative ACEs and PTG through PTSD symptoms was found (Table 3), wherein, a significant direct positive association was found between cumulative ACEs and PTSD symptoms and between PTSD symptoms and PTG (Figure 3). Hence, hypothesis 5 was fully supported.

On the other hand, hypothesis 3 predicted that cumulative ACEs would share a significant positive association with meaning-making and meaning-making would share a significant positive association with PTG through an indirect pathway. A significant indirect pathway between cumulative ACEs and PTG through meaning-making was found (Table 3), wherein, a significant direct positive association was found between meaning-making and PTG (Figure 3). However, a significant negative association (not positive) was found between cumulative ACEs and meaning-making (Figure 3). Hence, hypothesis 3 was partially supported.

Moreover, hypothesis 4 predicted that cumulative ACEs would share a significant negative association with resilience and resilience would share a significant positive association with PTG through an indirect pathway. A significant indirect pathway between cumulative ACEs and PTG through resilience was not found (Table 3), wherein, a direct negative association was found between cumulative ACEs and resilience but this did not reach significance (Figure 3). However, a significant positive association was found between resilience and PTG as predicted (Figure 3). Hence, hypothesis 4 was also partially supported.

Lastly, hypothesis 2 predicted that cumulative ACEs would share a significant association with PTG through all three indirect pathways that included meaning-making, emotional resilience, and PTSD symptoms as mediators. Only two out of three indirect pathways were found to be significant (Table 3). These pathways were mediated by meaning-making and PTSD symptoms (Figure 3). Resilience was not a significant mediator between cumulative ACEs and PTG. Hence, hypothesis 2 was also partially supported.

### **Additional Analyses**

In addition to testing the main model that examined the association between cumulative ACEs and PTG through meaning-making, resilience, and PTSD symptoms, further investigations were done. These evaluated individual ACE subtypes (abuse: emotional, physical, sexual; neglect: emotional, physical; and household dysfunctions: parental separation, mother maltreatment, substance abuse, mental illness, and criminal behavior), meaning-making subcomponents (presence and search for meaning), and PTG subcomponents (personal strength, new possibilities, appreciation for life, relating to others, and spiritual enrichment) within the original path model framework.

**ACE Subtypes.** Ten individual models were run where cumulative ACEs (exogenous variable) was replaced by each ACE subtype. Across each ACE subtype within the original path model framework, the model continued to be just identified which means that the model fit continued to be necessarily perfect,  $\chi^2(0, N=434) = .00, p = .00, CFI = 1.00, RMSEA = 0.00, 90\% CI = .00-.00, SRMR = .00$  for emotional abuse, ( $N = 434$ ), physical abuse ( $N = 434$ ), sexual abuse ( $N = 431$ ), emotional neglect ( $N = 435$ ), physical neglect ( $N = 435$ ), parental separation ( $N = 435$ ), mother maltreatment ( $N = 435$ ), substance abuse ( $N = 435$ ), mental illness ( $N = 434$ ), and criminal behavior ( $N = 435$ ).

For emotional abuse, all paths reached statistical significance (Figure 4), except the path from emotional abuse to PTG,  $\beta = .01, p = .85$  (path 1), and the path from emotional abuse to resilience,  $\beta = -.03, p = .49$  (path 4). In total, the model explained the following variances in meaning-making (1.4%), resilience (0.1%), PTSD symptoms (17.9%), and PTG (24.1%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that two indirect pathways that involved meaning-making (paths 2 and 3) and PTSD symptoms (paths 6 and 7) significantly mediated the association between emotional abuse and PTG. Resilience was not found to be a significant mediator between emotional abuse and PTG (Table 4).

For physical abuse, all paths reached statistical significance (Figure 5), except the path from physical abuse to PTG,  $\beta = -.01, p = .88$  (path 1), and the path from physical abuse to resilience,  $\beta = -.00, p = .99$  (path 4). In total, the model explained the following variances in meaning-making (2.3%), resilience (0%), PTSD symptoms (10.4%), and PTG (24.5%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that two indirect pathways that involved meaning-making (paths 2 and 3) and PTSD symptoms (paths 6

and 7) significantly mediated the association between physical abuse and PTG. Resilience was not found to be a significant mediator between physical abuse and PTG (Table 5).

For sexual abuse, all paths reached statistical significance (Figure 6), except the path from sexual abuse to meaning-making,  $\beta = .05, p = .35$  (path 2) and the path from sexual abuse to resilience,  $\beta = .06, p = .18$  (path 4). In total, the model explained the following variances in meaning-making (0.2%), resilience (0.4%), PTSD symptoms (2.9%), and PTG (25.3%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that only one indirect pathway that involved PTSD symptoms (paths 6 and 7) significantly mediated the association between sexual abuse and PTG. Meaning-making and resilience were not found to be significant mediators between sexual abuse and PTG (Table 6).

For emotional neglect, all paths reached statistical significance (Figure 7), except the path from emotional neglect to PTG,  $\beta = .06, p = .14$  (path 1). In total, the model explained the following variances in meaning-making (1.2%), resilience (1.5%), PTSD symptoms (15.5%), and PTG (24.6%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that all three indirect pathways that involved meaning-making (paths 2 and 3), PTSD symptoms (paths 6 and 7), and resilience (paths 4 and 5) significantly mediated the association between emotional neglect and PTG (Table 7).

For physical neglect, all paths reached statistical significance (Figure 8), except the path from physical neglect to PTG,  $\beta = .03, p = .46$  (path 1), and the path from physical neglect to resilience,  $\beta = .04, p = .41$  (path 4). In total, the model explained the following variances in meaning-making (1.8%), resilience (0.2%), PTSD symptoms (6.3%), and PTG (24.4%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that two indirect pathways that involved meaning-making (paths 2 and 3) and PTSD symptoms (paths 6

and 7) significantly mediated the association between physical neglect and PTG. Resilience was not found to be a significant mediator between physical neglect and PTG (Table 8).

For parental separation, all paths reached statistical significance (Figure 9), except the path from parental separation to PTG,  $\beta = .06, p = .11$  (path 1), and the path from parental separation to resilience,  $\beta = -.00, p = .94$  (path 4). In total, the model explained the following variances in meaning-making (2.5%), resilience (0%), PTSD symptoms (1.1%), and PTG (24.7%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that two indirect pathways that involved meaning-making (paths 2 and 3) and PTSD symptoms (paths 6 and 7) significantly mediated the association between parental separation and PTG. Resilience was not found to be a significant mediator between parental separation and PTG (Table 9).

For mother maltreatment, all paths reached statistical significance (Figure 10), except the path from mother maltreatment to PTG,  $\beta = .05, p = .15$  (path 1), the path from mother maltreatment to meaning-making,  $\beta = -.09, p = .11$  (path 2), and the path from mother maltreatment to resilience,  $\beta = .06, p = .21$  (path 4). In total, the model explained the following variances in meaning-making (0.8%), resilience (0.3%), PTSD symptoms (3.7%), and PTG (24.5%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that only one indirect pathway that involved PTSD symptoms (paths 6 and 7) significantly mediated the association between mother maltreatment and PTG. Meaning-making and resilience were not found to be significant mediators between mother maltreatment and PTG (Table 10).

For substance abuse, all paths reached statistical significance (Figure 11), except the path from substance abuse to meaning-making,  $\beta = -.07, p = .16$  (path 2), and the path from substance abuse to resilience,  $\beta = -.04, p = .47$  (path 4). In total, the model explained the following

variances in meaning-making (0.4%), resilience (0.1%), PTSD symptoms (5.3%), and PTG (24.9%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that only one indirect pathway that involved PTSD symptoms (paths 6 and 7) significantly mediated the association between substance abuse and PTG. Meaning-making and resilience were not found to be significant mediators between substance abuse and PTG (Table 11).

For mental illness, all paths reached statistical significance (Figure 12), except the path from mental illness to PTG,  $\beta = .01, p = .84$  (path 1), the path from mental illness to meaning-making,  $\beta = -.08, p = .11$  (path 2), and the path from mental illness to resilience,  $\beta = -.06, p = .22$  (path 4). In total, the model explained the following variances in meaning-making (0.6%), resilience (0.4%), PTSD symptoms (8.2%), and PTG (24.5%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that only one indirect pathway that involved PTSD symptoms (paths 6 and 7) significantly mediated the association between mental illness and PTG. Meaning-making and resilience were not found to be significant mediators between mental illness and PTG (Table 12).

For criminal behavior, all paths reached statistical significance (Figure 13), except the path from criminal behavior to meaning-making,  $\beta = -.06, p = .21$  (path 2), the path from criminal behavior to resilience,  $\beta = .01, p = .86$  (path 4). In total, the model explained the following variances in meaning-making (0.4%), resilience (0%), PTSD symptoms (1.2%), and PTG (25.4%). Moreover, using 5000 bootstrapped samples with 95% bias-corrected CI showed that only one indirect pathway that involved PTSD symptoms (paths 6 and 7) significantly mediated the association between criminal behavior and PTG. Meaning-making and resilience were not found to be significant mediators between criminal behavior and PTG (Table 13).



Overall, across the ACE subtypes findings, only three ACE subtypes shared a statistically significant direct positive association with PTG. These were sexual abuse, substance abuse, and criminal behavior. Furthermore, resilience was not found to be a significant mediator between the ACE subtype and PTG for all three abuse types (emotional, physical, sexual), for one neglect type (physical), and all five household dysfunctions (parental separation, mother maltreatment, substance abuse, mental illness, and criminal behavior). In other words, only emotional neglect was found to share a significant negative association with resilience. Moreover, meaning-making was not found to be a significant mediator between the ACE subtype and PTG for one abuse type (sexual abuse) and four household dysfunctions (mother maltreatment, substance abuse, mental illness, and criminal behavior). Lastly, only one ACE subtype, which was emotional neglect influenced PTG through all three mediators/indirect pathways (meaning-making, resilience, and PTG) and did not associate with PTG directly.

**Meaning-Making Subcomponents.** Two individual models were run where meaning-making (endogenous variable) was replaced by each of its forms (presence and search). Across each meaning-making subcomponent within the original path model framework, the model continued to be just identified which means that the model fit continued to be necessarily perfect,  $\chi^2(0, N = 567) = .00, p = .00, CFI = 1.00, RMSEA = 0.00, 90\% CI = .00-.00, SRMR = .00$  for presence of meaning ( $N = 428$ ), and search for meaning ( $N = 428$ ).

For presence of meaning, all paths reached statistical significance (Figure 14), except the path from cumulative ACEs and resilience similar to the full model results,  $\beta = -.03, p = .57$  (path 4). In total, the model explained the following variances in meaning-making (7.2%), resilience (0%), PTSD symptoms (20.2%), and PTG (25.7%). No change was found in the indirect pathways that were different from the full model (Table 3 and Table 14).

For search for meaning, all paths reached statistical significance (Figure 15), except the path from cumulative ACEs to PTG,  $\beta = .05, p = .33$  (path 1), and the path from cumulative ACEs to search for meaning,  $\beta = .09, p = .07$  (path 2), which indicated that it was primarily the presence of meaning and not search for meaning that mediated the relationship between cumulative ACEs and PTG. Moreover, the path from cumulative ACEs to resilience was also not statistically significant similar to the full model results,  $\beta = -.03, p = .57$  (path 4). In total, the model explained the following variances in meaning-making (0.8%), resilience (0.1%), PTSD symptoms (22.4%), and PTG (11.1%). Lastly, for the indirect effects, only one indirect pathway that involved PTSD symptoms (paths 6 and 7) significantly mediated the association between cumulative ACEs and PTG via search for meaning. Both search for meaning and resilience were not found to be significant mediators between cumulative ACEs and PTG when merely considering search for meaning and not presence of meaning. In other words, only PTSD symptoms was found to be significant mediator between cumulative ACEs and PTG (Table 15).

**PTG Subcomponents.** Five individual models were run where PTG (endogenous variable) was replaced by each of its subcomponents (personal strength, new possibilities, appreciation for life, relating to others, and spiritual enrichment). Across each PTG subcomponent within the original path model framework, the model continued to be just identified which means that the model fit continued to be necessarily perfect,  $\chi^2(0, N=439) = .00, p = .00, CFI = 1.00, RMSEA = 0.00, 90\% CI = .00-.00, SRMR = .00$  for personal strength ( $N = 439$ ), new possibilities ( $N = 437$ ), appreciation for life ( $N = 434$ ), relating to others ( $N = 438$ ), and spiritual enrichment ( $N = 440$ ).

For personal strength, all paths reached statistical significance (Figure 16), except the path from cumulative ACEs to resilience similar to the full model finding,  $\beta = -.02, p = .66$  (path

4). In total, this model explained the following variances in meaning-making (2.9%), resilience (0%), PTSD symptoms (21.2%), and personal strength (25.5%). No change was found in the indirect pathways that were different from the full model (Table 3 and Table 16).

For new possibilities, all paths reached statistical significance (Figure 17), except the path from cumulative ACEs to resilience similar to the full model finding,  $\beta = -.02, p = .64$  (path 4). In total, this model explained the following variances in meaning-making (2.9%), resilience (0.1%), PTSD symptoms (21.5%), and new possibilities (25.8%). No change was found in the indirect pathways that were different from the full model (Table 3 and Table 17).

For appreciation for life, all paths reached statistical significance (Figure 18), except the path from cumulative ACEs to resilience similar to the full model finding,  $\beta = -.03, p = .59$  (path 4). In total, this model explained the following variances in meaning-making (3.1%), resilience (0.1%), PTSD symptoms (22.1%), and appreciation for life (25.0%). No change was found in the indirect pathways that were different from the full model (Table 3 and Table 18).

For relating to others, all paths reached statistical significance (Figure 19), except the path from cumulative ACEs to PTG relating to others,  $\beta = .01, p = .86$  (path 1), the path from resilience to relating to others,  $\beta = .03, p = .59$  (path 5), the path from PTSD symptoms to relating to others,  $\beta = .09, p = .11$  (path 7), and the path from cumulative ACEs to resilience,  $\beta = -.03, p = .61$  (path 4 – similar to full model). In total, this model explained the following variances in meaning-making (2.8%), resilience (0.1%), PTSD symptoms (21.4%), and relating to others (14.9%). Lastly, for the indirect effects, only one indirect pathway that involved meaning-making (paths 2 and 3) significantly mediated the association between cumulative ACEs and relating to others. Neither PTSD symptoms nor resilience was found to be significant mediators (Table 19).

For spiritual enrichment, all paths reached statistical significance (Figure 20), except the path from cumulative ACEs to PTG spiritual enrichment,  $\beta = .03$ ,  $p = .50$  (path 1), and the path from cumulative ACEs to resilience,  $\beta = -.02$ ,  $p = .64$  (path 4 – similar to full model). In total, this model explained the following variances in meaning-making (2.8%), resilience (0.1%), PTSD symptoms (21.3%), and spiritual enrichment (14.0%). No change was found in the indirect pathways that were different from the full model (Table 3 and Table 20).

Overall, across the PTG subcomponents, only two PTG subcomponents (relating to other and spiritual enrichment) did not share a direct association with cumulative ACEs. Personal strength, new possibilities, and appreciation for life were all directly associated with cumulative ACEs, which showed that the direct association between cumulative ACEs and PTG in the full model was specifically due to the PTG subcomponents of personal strength, new possibilities, and appreciation for life. Moreover, cumulative ACEs to resilience were not found to be significant in the presence of all PTG subcomponents, and no change was found in the indirect pathways that were different from the full model for all five PTG subcomponents. In other words, the indirect pathway from cumulative ACEs to all PTG subcomponents were not mediated by resilience. Lastly, only the PTG subcomponent of relating to others was mediated only by meaning-making in an indirect pathway. The rest of the PTG subcomponents and their indirect associations with cumulative ACEs were also mediated by PTSD symptoms.

### **Discussion**

The current study aimed to explore the relationship between cumulative ACEs and PTG directly, and indirectly through three mediators, meaning-making, resilience, and PTSD symptoms. This study presented the first path model analyses that examined the relationships between ACEs and PTG through meaning-making, resilience, and PTSD symptoms in a dynamic

framework model using a cross-sectional study design. Findings showed that cumulative ACEs shared a significant positive relationship with PTG directly, specifically three PTG dimensions that included personal strength, new possibilities, and appreciation for life. Cumulative ACEs also shared a significant relationship with PTG indirectly through two essential mediators, meaning-making and PTSD symptoms. This study also revealed intriguing novel findings and results that supported prior research findings, which will be elaborated on below.

### **ACEs and PTG: Direct Mechanism**

In line with the study's hypotheses that were based on preceding literature examining the five key constructs — ACEs, PTG, meaning-making, resilience, and PTSD symptoms — we not only found a direct positive association between specific ACE subtypes (sexual abuse, substance abuse, and criminal behavior) and PTG, but also a direct positive association between cumulative ACEs and PTG within our sample. The latter is a novel contribution from this study that fills the previously mentioned gap in ACEs and PTG research (Cline, 2013; Easton et al., 2013; Mohr & Rosén, 2017). In other words, this study provided evidence and support for our first hypothesis that cumulative ACEs shared a positive relationship with PTG through a direct mechanism.

Although prior studies showed a significant positive connection between ACE subtypes of emotional abuse, physical abuse, sexual abuse, and neglect with PTG (Cline, 2013; Easton et al., 2013; Mohr & Rosén, 2017), this study also added to these findings by revealing two new ACE subtypes, which fell under the household dysfunctions category. These included substance abuse and criminal behavior by a household member, both sharing a significant positive relationship with PTG.

Overall, these findings suggest that the more one experiences either of these ACE subtypes from abuse (emotional, physical, sexual), neglect, and household dysfunctions

(substance abuse, criminal behavior) in the first 18 years of life, the higher is one's likelihood of experiencing PTG in adulthood. Moreover, this relationship was also found when these ACE subtypes were studied cumulatively, indicating that these ACE subtypes together, also played a role in enhancing the likelihood of adult PTG. These findings are important as they show that experiencing ACEs individually or collectively provides a direct mechanism through which PTG may be experienced in adulthood several years after experiencing a childhood traumatic event.

### **ACEs and PTG: Indirect Mechanisms**

In addition to the direct pathway between subtype/cumulative ACEs and PTG, this study also provided evidence for two important indirect pathways between cumulative ACEs and PTG, which were mediated by meaning-making and PTSD symptoms, but not emotional resilience. In the following section, we will look at the first indirect pathway that involved meaning-making as the mediating variable between cumulative ACEs and PTG.

### **ACEs and PTG: Indirect Mechanism via Meaning-Making**

In line with prior research (Mazor et al., 2018; Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019), this study provided evidence that meaning-making when studied more directly and not as another variable such as "event centrality" or "understanding an ACE" that foreshadowed meaning-making (Easton et al., 2013; Tranter et al., 2021) worked as an essential mediator between cumulative ACEs and PTG.

This study provided novel evidence that meaning-making shared a relationship with cumulative ACEs and not just past trauma using quantitative analyses, thereby addressing an important previously mentioned gap in research where meaning-making was only studied qualitatively (Anderson et al. 2011; Jirek et al., 2017) and in the context of past trauma, not ACEs (Mazor et al., 2018, Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019).

Moreover, as a result of this study, meaning-making was evidentially supported to be a key mediator between cumulative ACEs and PTG mainly through the presence of meaning and not search for meaning. This suggested that when one can create meaning from their adverse childhood event/s (i.e., meaning has been created and one is not in search of it anymore), this process of creating a sense of coherence and purpose from the chaos and confusion of an adverse event, inadvertently increases the likelihood of experiencing PTG in adulthood. This, in turn, supports prior findings that revealed a positive association between meaning-making and PTG (Waters et al., 2013; Zeligman et al., 2019; Zheng et al., 2019), but specifically in the context of ACEs within this study.

In contrast, although it was hypothesized that meaning-making would share a significant positive association with cumulative ACEs, this study found the opposite result where a significant negative association was found between meaning-making and cumulative ACEs. Since this assumption was initially based on qualitative studies (Anderson et al. 2011; Jirek et al., 2017), the study's quantitative data provide substantial evidence of the likelihood that experiencing a greater number of ACEs may impinge on one's meaning-making capacities, or, experiencing a lower number of ACEs may enhance one's meaning-making capacities, indicating a potential optimal level of exposure to ACEs that may increase the likelihood of meaning-making, which would be worth investigating in future studies. Moreover, the negative indirect pathway could also indicate that greater number of ACEs through meaning-making decrease PTG.

In essence, this study indicated a novel mechanism through which cumulative ACEs shared an indirect relationship with PTG where a lower exposure to ACEs that were reported by the participants, increased their likelihood of meaning-making, that in turn increased their

likelihood of experiencing PTG in adulthood across our sample. Since a majority of this study's participants indicated — to be receptive to the idea of meaning-making from their ACE (63.5%) and a large number of participants indicated that they had found meaning from their ACE experience/s with most reporting experiencing between two to four (lower number) ACEs (73.6%) — all of these factors supported the significant contribution of meaning-making as a mediator between cumulative ACEs and PTG in this sample.

### **ACEs and PTG: Indirect Mechanism via PTSD Symptoms**

In line with prior research, this study provided evidence for the relationship between PTSD symptoms with cumulative ACEs and PTG (Brockie et al., 2015; Boals & Schuettler, 2011; Frewen et al., 2019; Kleim & Ehlers, 2009; Schalinski et al., 2016; Shakespeare-Finch & Lurie-Beck, 2014). Given the vast amount of research on the positive association between ACEs and adult psychopathology, specifically PTSD symptoms (Brockie et al., 2015; Frewen et al., 2019; Schalinski et al., 2016), this study buttresses the finding and indicates that the participants who reported experiencing a greater number of ACEs were more likely to also report experiencing PTSD symptoms in adulthood. Moreover, in line with our hypothesis, this study further clarified a positive relationship between PTSD symptoms and PTG (Boals & Schuettler, 2011; Shakespeare-Finch & Lurie-Beck, 2014), and did not replicate the curvilinear nature of this relationship that was found in prior studies (Kleim & Ehlers, 2009; Shakespeare-Finch & Lurie-Beck, 2014) and within the context of cumulative ACEs in this study.

Importantly, this study provided novel evidence for PTSD symptoms as another key mediator between cumulative ACEs and PTG, which explains the fact that even those participants who reported PTSD symptoms relevant to their ACEs, experienced PTG in light of their co-existing PTSD symptomology. As suggested in prior research, struggling with PTSD



allows one to contemplate growth and a possible motivation to aim toward growth post adversity (Kleim & Ehlers, 2009; Shakespeare-Finch & Lurie-Beck, 2014).

In essence, this study indicated another novel mechanism through which cumulative ACEs shared an indirect relationship with PTG, where exposure to cumulative ACEs increased the likelihood of PTSD symptomology in adulthood that in turn increased the likelihood of experiencing PTG in adulthood across our sample.

### **ACEs and PTG: Indirect Mechanism via Resilience**

In line with prior research (Chen et al., 2021; Pasha-Zaidi et al., 2020; Yund, 2021), this study provided evidence for a non-significant negative relationship between emotional resilience and cumulative ACEs, supporting the results found in Pasha-Zaidi et al. (2020), but not Chen et al. (2021) and Yund (2021) study findings where resilience was found to have a significant negative relationship with ACEs.

Several explanations may account for this finding. First, studies have indicated the role of gender as a moderator of resilience between ACE subtypes, cumulative ACEs, and PTG in a moderated mediation model (Chen et al., 2021; Pasha-Zaidi et al., 2020). These studies showed that for females, resilience acted as a significant mediator between ACE subtypes of abuse/neglect and PTG versus males for whom resilience acted as a significant mediator between the ACE category of household dysfunctions and PTG (Chen et al., 2021), which suggested gender differences in how different ACE subtypes are experienced and its relationship with PTG. Moreover, gender was also found to moderate the association between cumulative ACEs and PTG where lower resilience was found in females as a result of childhood trauma versus males (Pasha-Zaidi et al., 2020). In our study, cumulative ACEs and nine out of ten ACE subtypes except emotional neglect showed a non-significant negative association with resilience. Perhaps

understanding the role of gender on resilience in a moderated mediation model, especially in the context of emotional neglect would have yielded significant findings. This would be worth investigating in future studies.

Secondly, a review by Bonanno and Diminich (2013) proposed a distinction between two types of resilience post adversity that have not been addressed with such specificity in prior research. These were proposed as “emergent resilience” and “minimal impact resilience,” where the former constituted successful adaptation in the context of chronic adverse events, and the latter constituted successful adaptation in the context of isolated adverse events. Our study did not address or measure these two types of resilience nor did it examine the temporal nature of the childhood traumatic events/ACEs. Our study did account, more precisely, for ACE subtypes and cumulative ACEs but did not explore the chronic or acute (temporal) nature of these ACEs. Perhaps examining the temporal role of ACEs on each of these resilience types may have yielded significant findings. These distinctions must be explored in future research.

Lastly, given the counterintuitive observation across this study’s participants where those who reported higher scores on ACEs were also more likely to do the resilience scale versus those who did not, may also indicate a pattern in which participants approached our survey, and call for further inquiry as to what made our participants behave in this manner. Perhaps the participants who perceived themselves as experiencing greater ACEs also felt more comfortable or conscientious about sharing their resilience levels versus those who did not. It would be interesting to examine our dynamic framework model using another resilience scale or one which most likely encourages a greater response rate that is independent of participants’ ACE perceptions.

Furthermore, in line with prior research (Chen et al., 2021; Lee et al., 2020; Yund, 2021) our study also provided evidence for a positive association between resilience and PTG, suggesting that just as found in the relationship between PTSD symptoms and PTG above, resilience can also co-exist with PTG. This finding also clarifies and rules off prior research findings that indicated a negative association between resilience and PTG (Tranter et al., 2021; Weber, 2021). The current study showed that the presence of resilience across the participants also related to PTG independent of ACEs, which suggests that one can experience a successful adaptation post adversity as well as explicit dimensions of growth. In other words, the presence of resilience does not entail the absence of PTG. Both can be experienced by an individual.

Lastly, it is important to note that due to the non-significant negative association between ACEs and resilience, this study did not find resilience as a key mediator between ACEs and PTG. Instead, this study's findings suggest that resilience may increase the likelihood of PTG but is independent of ACEs due to the possibility of another moderator variable influencing the path between ACEs and resilience. A future examination of this relationship is encouraged.

### **Additional Relationships: ACEs, Meaning-Making, PTG**

In light of the subcomponent findings across ACEs (abuse: emotional, physical, sexual; neglect: emotional, physical; and household dysfunctions: parental separation, mother maltreatment, substance abuse, mental illness, and criminal behavior), meaning-making (presence and search for meaning), and PTG (personal strength, new possibilities, appreciation for life, relating to others, and spiritual enrichment), the subcomponent findings provided greater clarity towards the original path model framework findings.

First, it was found that even though the original path model framework found meaning-making and PTSD symptoms as two significant mediators between cumulative ACEs and PTG,

but not resilience, this was only true for nine out of ten ACE subtypes. The indirect path between emotional neglect and PTG was significantly mediated by resilience, meaning-making, and PTSD symptoms.

This was a novel finding with a possible explanation that not experiencing emotional neglect as a child might increase the likelihood of building resilience and meaning-making capacities in adulthood that in turn increase the chance of PTG. This could be because the absence of emotional neglect provides the neurons in an early developing brain the opportunity for neurogenesis that may contribute to the likelihood of building certain growth-promoting capacities post adversity (Perry, 2002; Teicher & Samson, 2016). Given that this was the only ACE subtype to have a significant negative association with resilience, this might also explain the lack of a significant negative association between cumulative ACEs and resilience as none of the other ACE subtypes contributed to a significant association with resilience except one.

It also suggests that, while the presence of emotional neglect may decrease the chances of resilience in adulthood, the presence of other ACE subtypes do not significantly decrease the chances of resilience in adulthood, indicating that emotional neglect is a more costly ACE to experience especially during sensitive and critical periods of childhood as neglect does not even provide the environment for neurogenesis to occur, whereas abuse and other ACE subtypes might do (Teicher & Samson, 2016).

Second, the subcomponent findings across ACEs also revealed that specific ACE subtypes such as sexual abuse, mother maltreatment, substance abuse, mental illness, and criminal behavior were not significantly associated with meaning-making and therefore did not reveal meaning-making as a significant mediator between each of them and PTG individually. This is another novel yet important finding in this study as it showed why it was important for

this study to examine cumulative ACEs per se and not just ACE subtypes as done in prior research, the former being the main goal of this study. These findings suggest that examining cumulative ACEs over specific ACE subtypes contributes to the significant mediation role of meaning-making between cumulative ACEs and PTG, which may have been absent if only each ACE subtype/s were studied. This also sheds light on the fact that future interventions, where meaning-making might be implemented in the context of — childhood sexual abuse, mother maltreatment, substance abuse, mental illness, and criminal behavior — must be viewed with caution as meaning-making for these ACE subtypes becomes more challenging.

Third, the subcomponent findings across PTG were also helpful in revealing specific dimensions of PTG that were reported by our participants, that were, personal strength, new possibilities, and appreciation for life, which were all directly associated with cumulative ACEs. Whereas PTG dimensions that included relating to others and spiritual enrichment were indirectly associated with cumulative ACEs via meaning-making or PTSD symptom mediators. These novel findings also enhance our understanding of the inter-dynamics of our key constructs as they provide greater clarity on what kind of interventions or mechanisms might work for what types of PTG. For example, suppose one desires to grow spiritually after experiencing an ACE but struggles with this, then one can be recommended a meaning-making intervention or program that could help increase the likelihood of experiencing this specific PTG. Moreover, knowledge of these patterns helps us explain why a certain person may simply experience cumulative ACEs and more likely experience personal strength in adulthood versus spiritual enrichment even without the presence of PTSD symptoms or the utilization of the meaning-making process.

## **Limitations**

There were several key limitations in this study. First, given the cross-sectional nature of this study design, all findings are limited at the correlational level and do not reveal causations. Due to this, findings must be viewed in light of their cross-sectional nature and help provide a basis for future longitudinal research on the five key constructs investigated in this study.

Second, the study findings cannot be generalized beyond a North-American, young adult, non-clinical student population as this was the predominant sample in this study, which provides room for future research to explore a more global sample or one that is more clinical.

Third, the study examined covariance patterns between cumulative ACEs and PTG and their relationship with the three mediators, meaning-making, resilience, and PTSD symptoms. However, the relationship amongst the mediators themselves — meaning-making, resilience, and PTSD symptoms — was not assessed in the path model. Therefore, other pathways or mechanisms that may have worked through the interaction amongst these mediators might have been missed. For example, in the bivariate correlational analyses, it was found that all the mediators had significant associations amongst them. Meaning-making and resilience shared a positive association with each other, whereas both meaning-making and resilience, each, shared a negative association with PTSD symptoms, indicating that higher meaning-making and higher resilience, decreased the likelihood of PTSD symptoms. However, the role of cumulative ACEs and PTG amongst these mediators were not studied, which could have provided greater clarity or provided alternate significant pathways through which cumulative ACEs might have been related to PTG. Considering these paths may have also enabled resilience to act as a significant mediator

between cumulative ACEs and PTG (e.g., cumulative ACEs → meaning-making → resilience → PTSD symptoms → PTG). These investigations must be explored in future research.

Fourth, most of the participants in this study reported experiencing an average of two to four ACEs. Since prior studies have indicated (Felitti, 2009, Felitti et al., 2019) four ACEs as a cutoff beyond which the risk of future psychopathologies increases substantially, it would be informative to explore the original dynamic framework in this study across a sample with four or more ACEs to see whether the findings of this study still hold in a sample reporting higher ACE/s severity. This will also help find whether there is an optimal exposure to ACEs that increases the likelihood of the meaning-making capacity.

Lastly, due to the lack of using a more elaborate resilience scale and one that could precisely measure the different types of resilience, the nature of the results found between ACEs and resilience should be viewed in light of this study specifically, where resilience was measured more generally. It would be interesting to see if using another resilience measure with more than five items shifts these findings in a significant direction. Additionally, it might also help assessing for moderators such as gender in future studies through a moderator mediation type interaction model.

### **Future Research Directions**

Given the key limitations in this study, it would be helpful to explore the dynamic framework model in a prospective study design. This would help provide evidence of causation and not just correlations.

Second, investigating the dynamic framework model across a variety of different samples such as a global population, clinical population, sample with higher ACEs above the cutoff of four ACEs, etc., would expand our knowledge about the key study variables and how they

behave in different settings. For example, perhaps one can find that experiencing an optimal number of ACEs may enhance meaning-making capacities.

Third, examining the pathways amongst the mediators, and the relationship between resilience and PTG in the context of moderated mediation models would also shed more clarity on the inter-variable dynamics in the dynamic framework model. For example, while resilience was not found to be a significant mediator between cumulative ACEs and PTG through the covariance pathways, maybe it could be found to be a significant mediator via pathways amongst the mediators where resilience may work in conjunction with meaning-making or PTSD symptomology to increase the likelihood of PTG.

Lastly, using measures that assess more items of resilience and different types of resilience would also help clarify the current study findings between cumulative ACEs and resilience, showing whether the findings in this study were a result of the brief resilience measure that was used or a result of the reported resilience itself.

### **Implications for Preventions and Treatment**

Despite the high risk of ACEs on adult mental health, this study provides valuable and hopeful data on how experiencing ACEs could also increase one's likelihood of PTG. Knowing that cumulative ACEs and ACE subtype/s both share significant direct and indirect relationships with PTG in adulthood provides avenues through which people who struggle to grow post adversity may receive help in achieving the different dimensions of PTG.

Investigating the role of meaning-making, PTSD symptomology, and resilience could provide foundational knowledge on which apropos interventions involving meaning-making, resilience, and PTSD symptomology could be built. For example, someone who may have



experienced childhood physical abuse may find that meaning-making helps in increasing their chances of PTG.

Meaning-Making interventions such as logotherapy or other programs that educate about finding meaning, personal responsibility, one's purpose, freedom, values of life, and creativity (Frankl, 1985; Lim & Kang, 2018; Robotmili et al., 2015) could be tailored to be more specific to samples who have experienced certain ACE subtypes over others for which meaning-making is related to a higher likelihood of PTG, based on pre-existing data, such as the one provided by this study.

Furthermore, given that the field of clinical psychology or health service psychology is geared in the direction of greater utilization of artificial intelligence, studies like the current one could also provide the basis through which people may create and utilize devices that may be able to measure their levels of meaning-making, resilience, and PTSD symptomology at any given time, and create charts (similar to personality tests) that provide greater insights and guiding steps as to what they could do to boost their levels of growth post adversity (PTG).

PTG offers hopeful research for the future, especially for people with histories of ACEs. Victims of ACEs deserve a better life and this research will help guide them in the direction of one.

## **Conclusion**

In conclusion, this study found that cumulative ACEs can, directly and indirectly, relate to PTG through a positive association. The indirect mechanisms through which cumulative ACEs relate to PTG include two important mediators, meaning-making and PTSD symptoms. Future interventions such as meaning-making programs and PTSD symptom monitoring can be

developed based on foundational knowledge provided by studies like the current one to help individuals increase their likelihood of experiencing PTG after experiencing ACEs.

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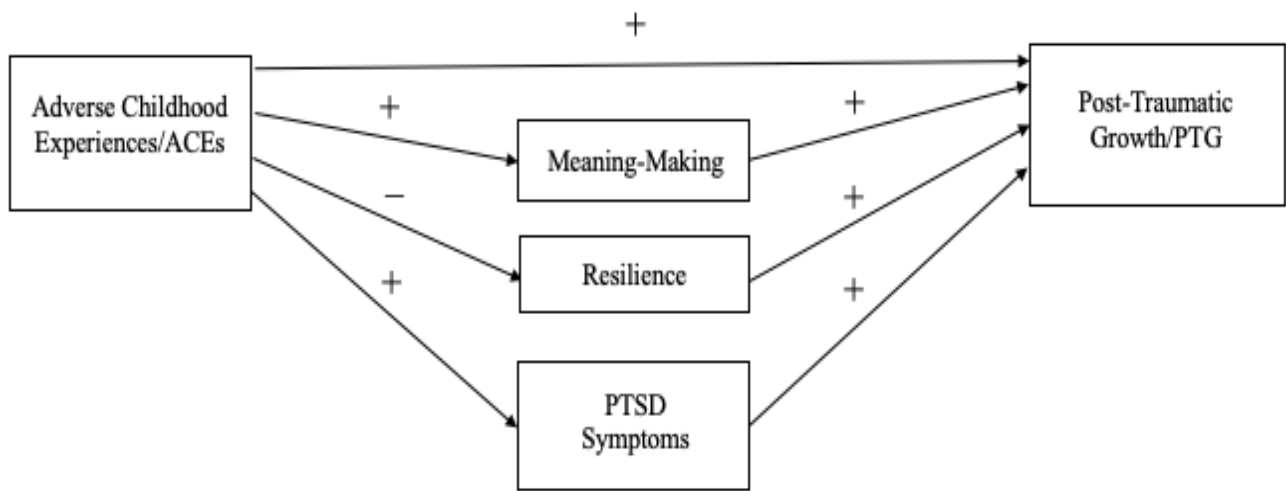
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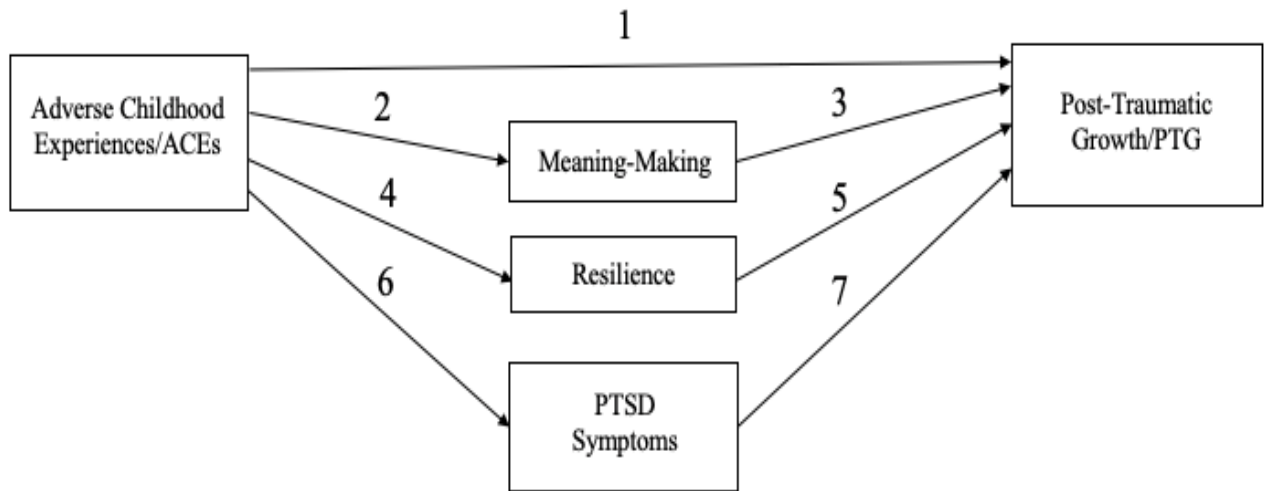
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**Appendix A. Figures**

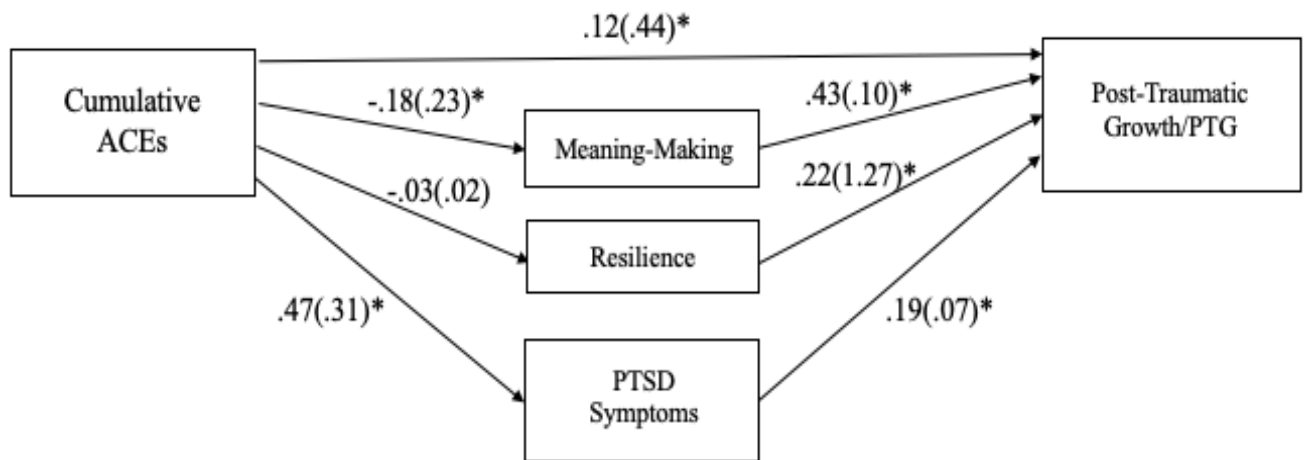
**Figure 1.** *ACEs and PTG Dynamic Framework Model*



**Figure 2.** *ACEs and PTG Seven Paths of the Hypothesized Model*

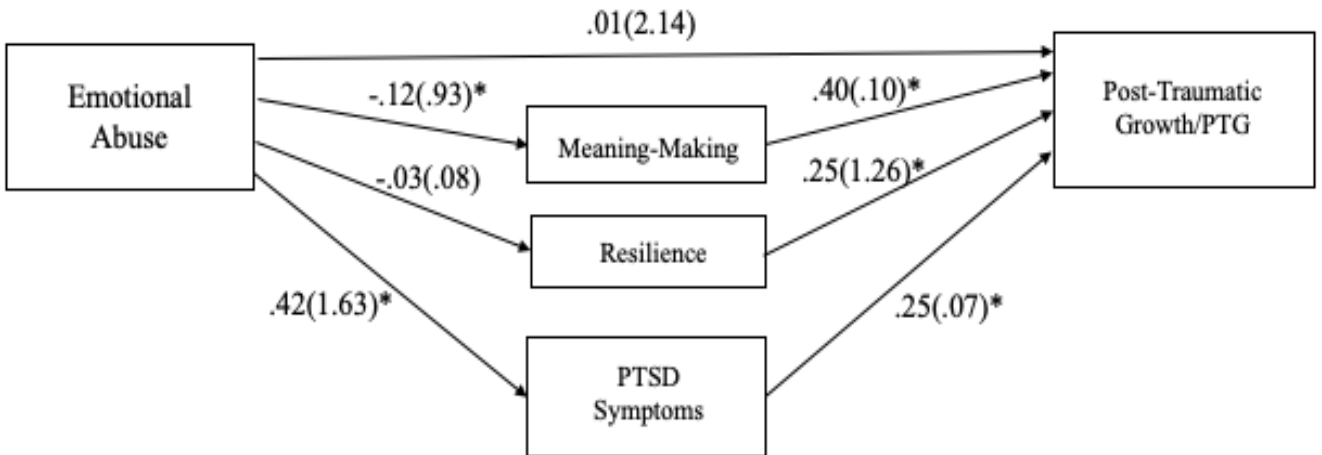


**Figure 2.** Results of Cumulative ACEs and PTG Path Analytic Model



Note. N=428 for full model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

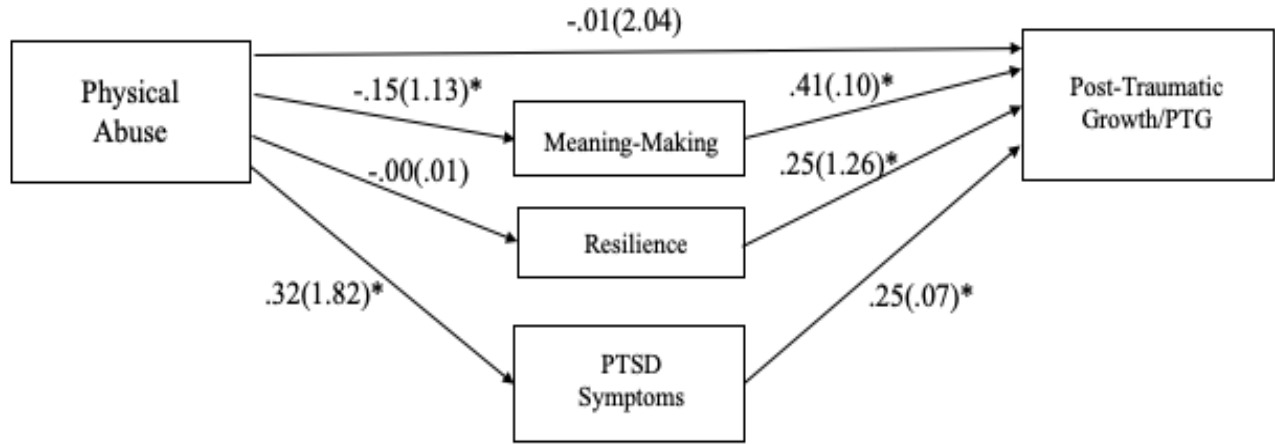
**Figure 4.** Results of ACE Subtype: Emotional Abuse and PTG Path Analytic Model



Note.  $N=434$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

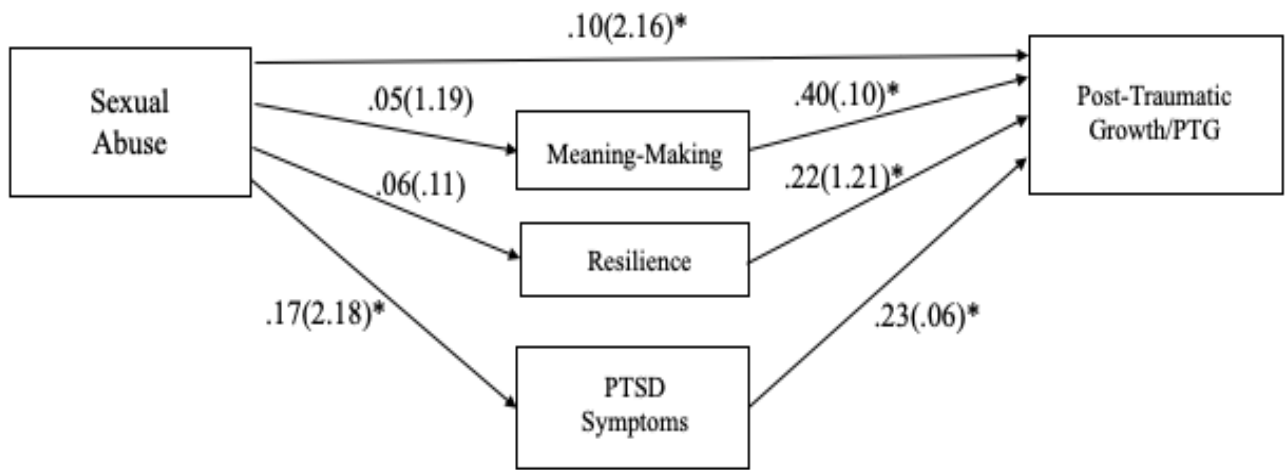
**Figure 5.** Results of ACE Subtype: Physical Abuse and PTG Path Analytic Model





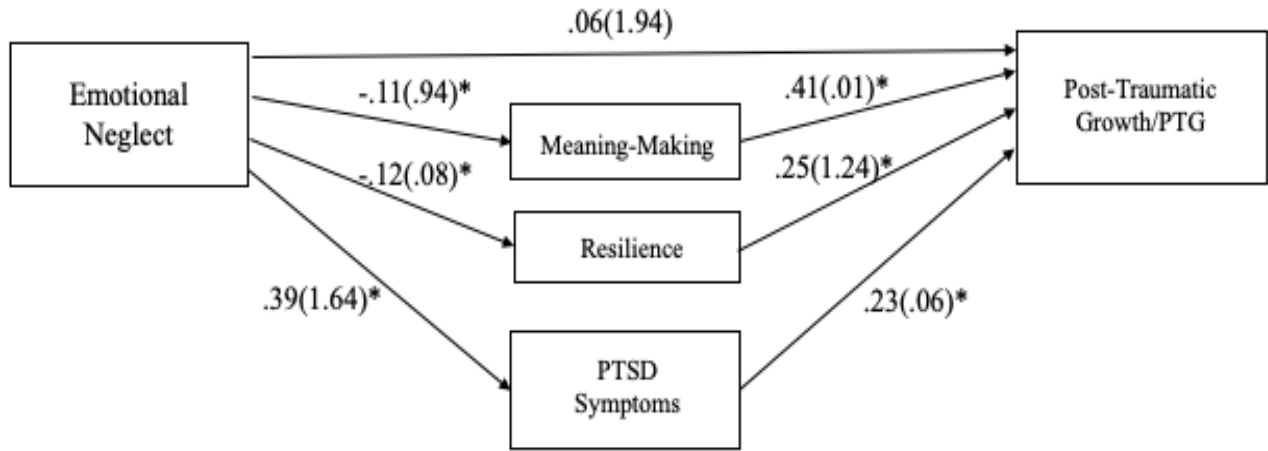
Note.  $N=434$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 6.** Results of ACE Subtype: Sexual Abuse and PTG Path Analytic Model



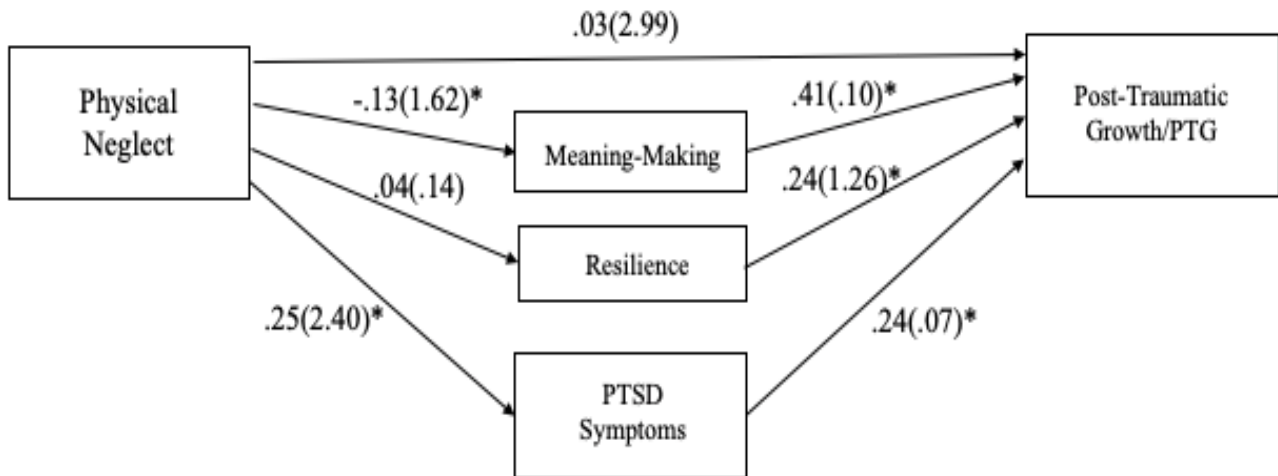
Note.  $N=431$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 7.** Results of ACE Subtype: Emotional Neglect and PTG Path Analytic Model



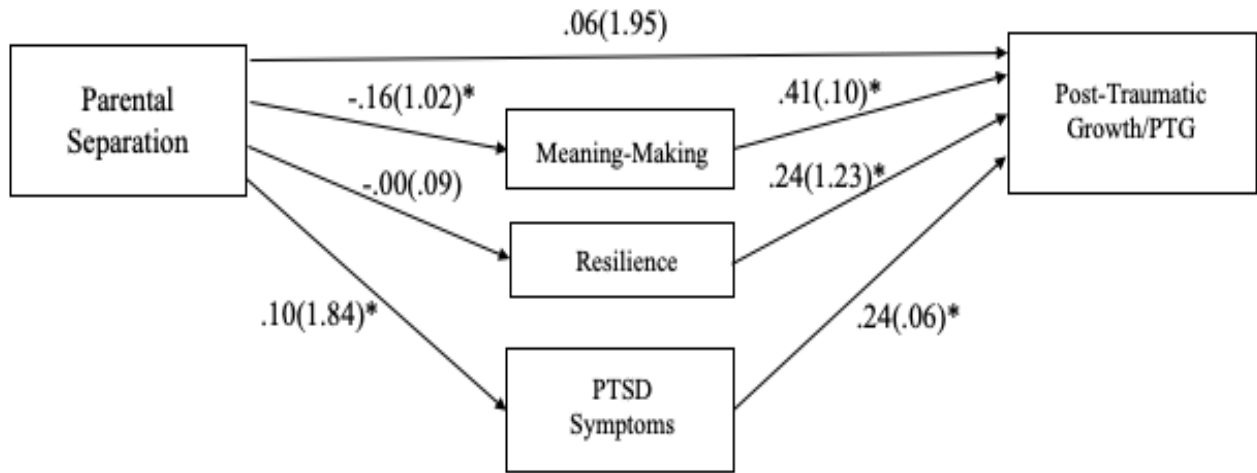
Note. N=435 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 8.** Results of ACE Subtype: Physical Neglect and PTG Path Analytic Model



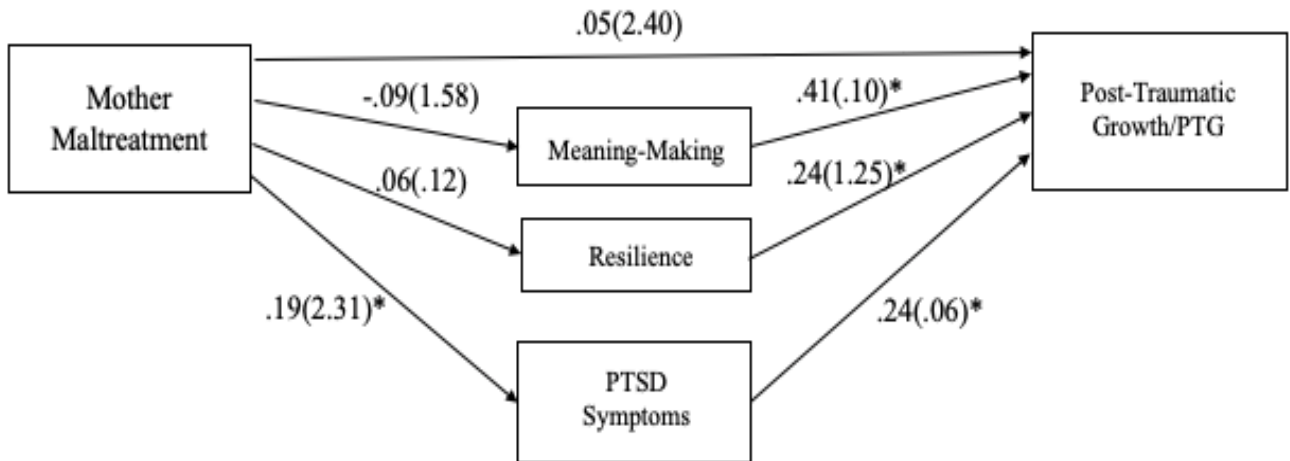
Note. N=435 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 9.** Results of ACE Subtype: Parental Separation and PTG Path Analytic Model



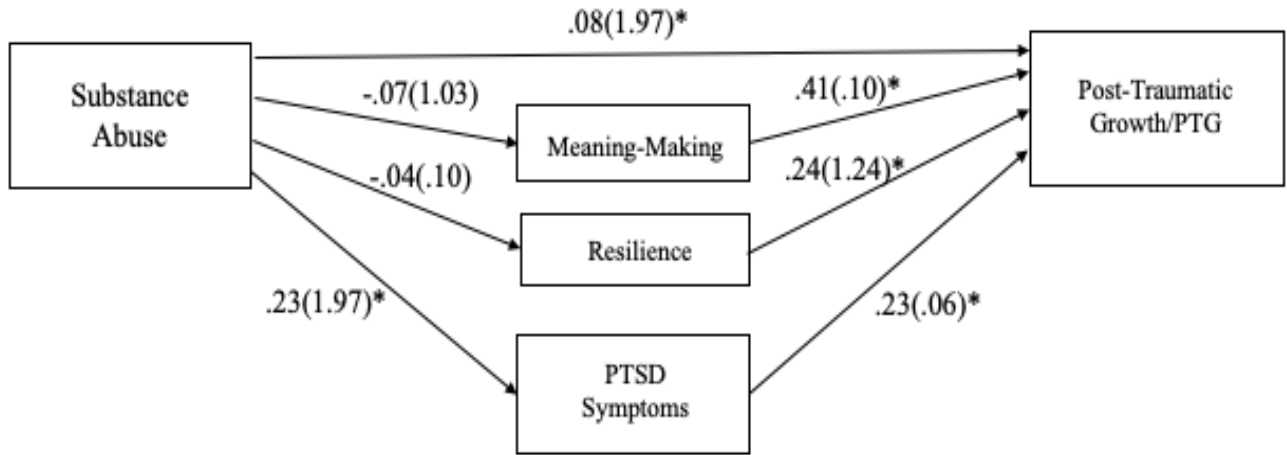
Note. N=435 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 10.** Results of ACE Subtype: Mother Maltreatment and PTG Path Analytic Model



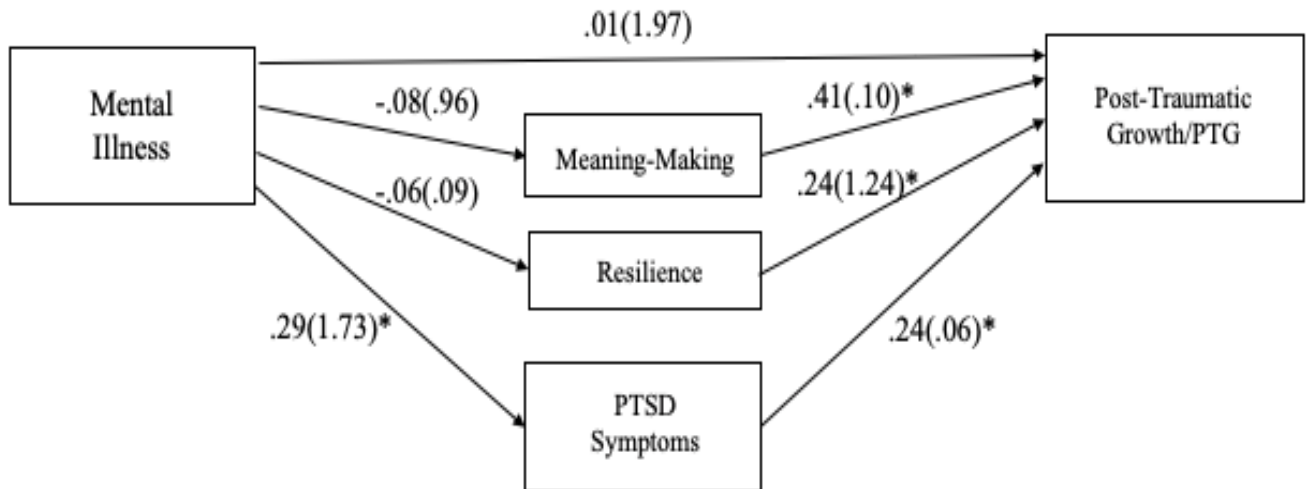
Note. N=435 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 11.** Results of ACE Subtype: Substance Abuse and PTG Path Analytic Model



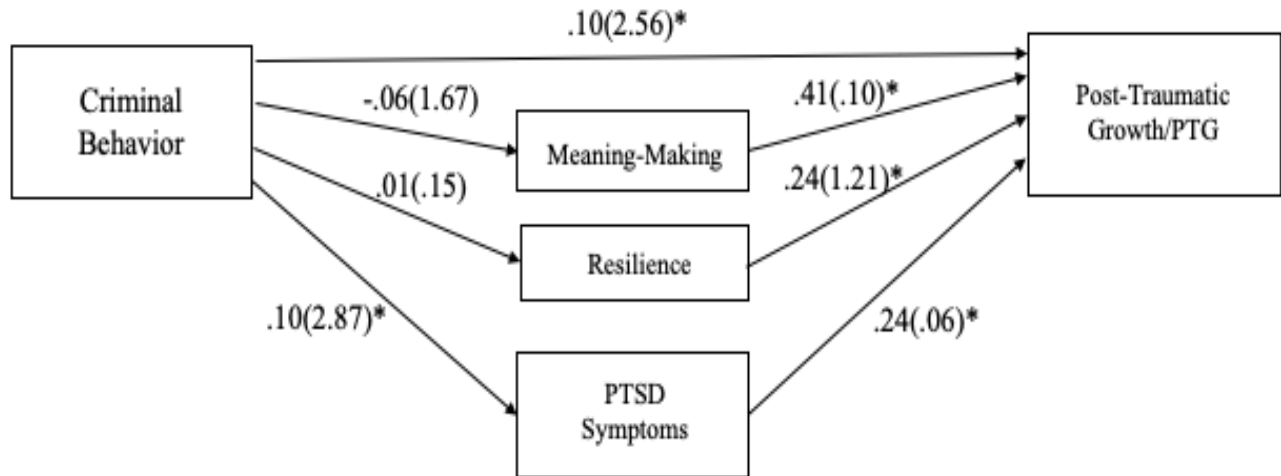
Note. N=435 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 12.** Results of ACE Subtype: Mental Illness and PTG Path Analytic Model



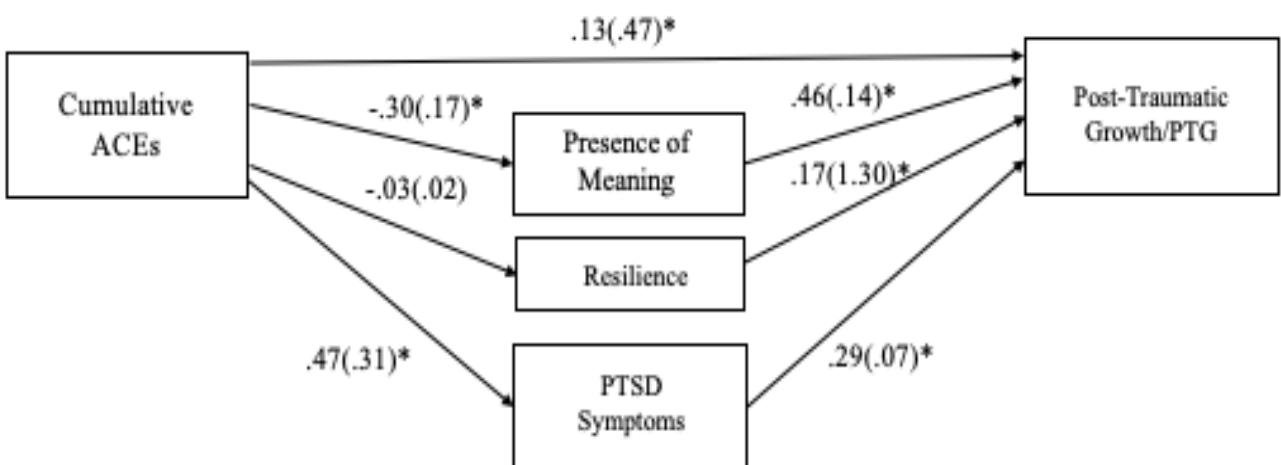
Note. N=434 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 13.** Results of ACE Subtype: Criminal Behavior and PTG Path Analytic Model



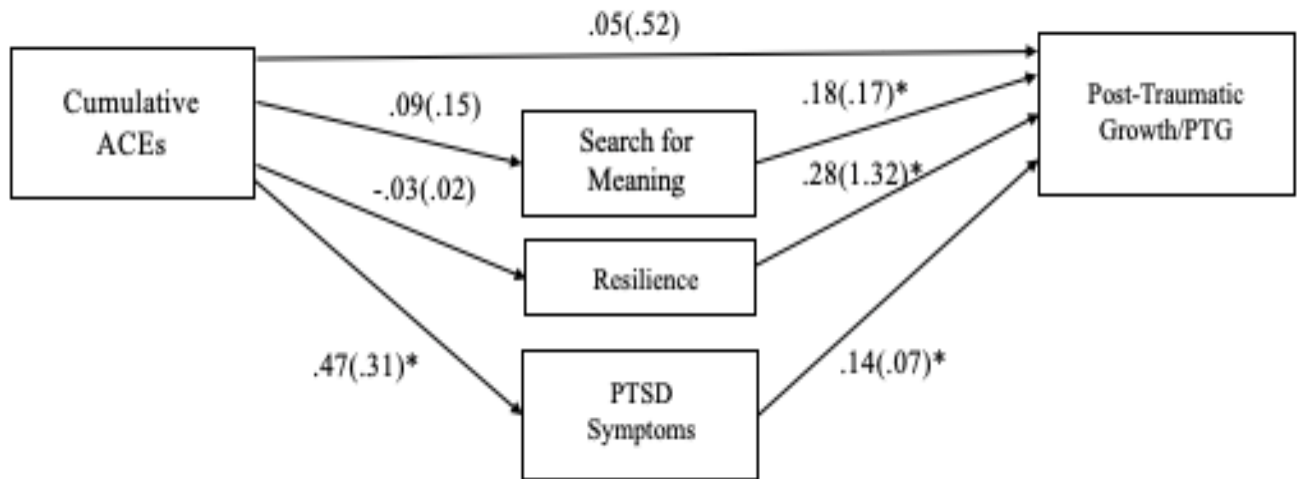
Note.  $N=435$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 14.** Results of Cumulative ACEs, Presence of Meaning, PTG Path Analytic Model



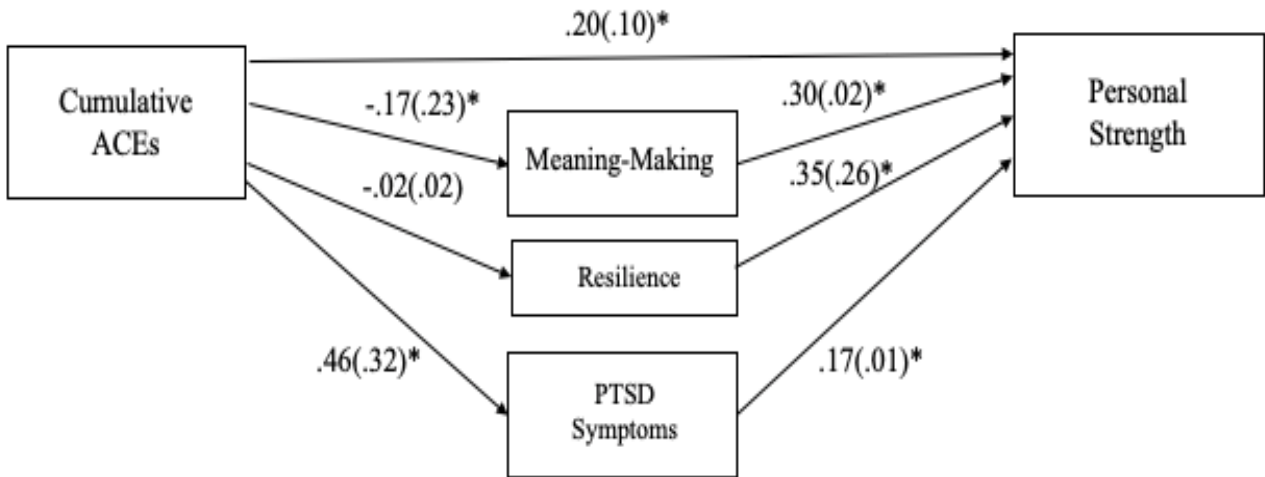
Note.  $N=567$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 15.** Results of Cumulative ACEs, Search for Meaning, PTG Path Analytic Model



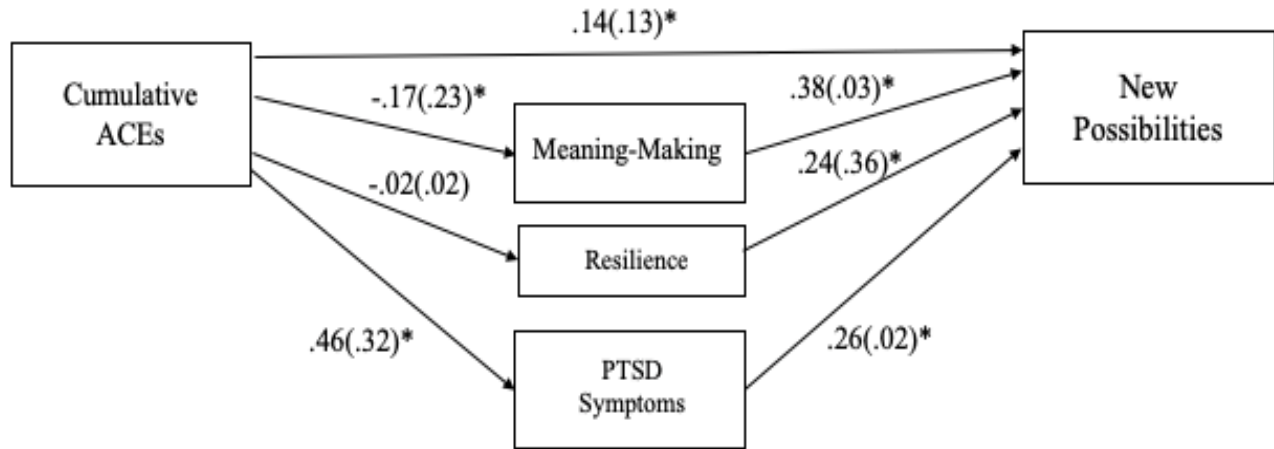
Note.  $N=428$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 16.** Results of Cumulative ACE and PTG Personal Strength Path Analytic Model



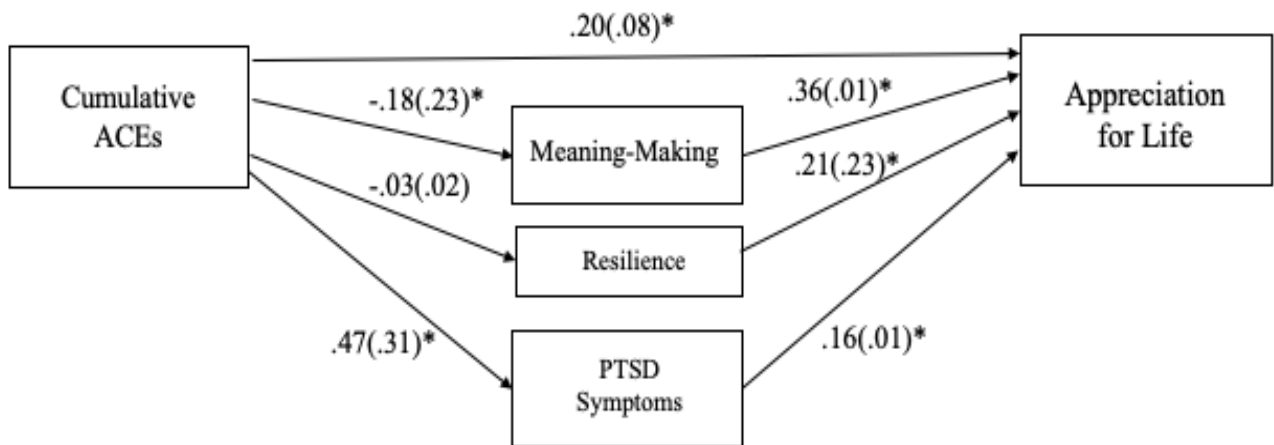
Note.  $N=439$  for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .

**Figure 17.** Results of Cumulative ACE and PTG New Possibilities Path Analytic Model



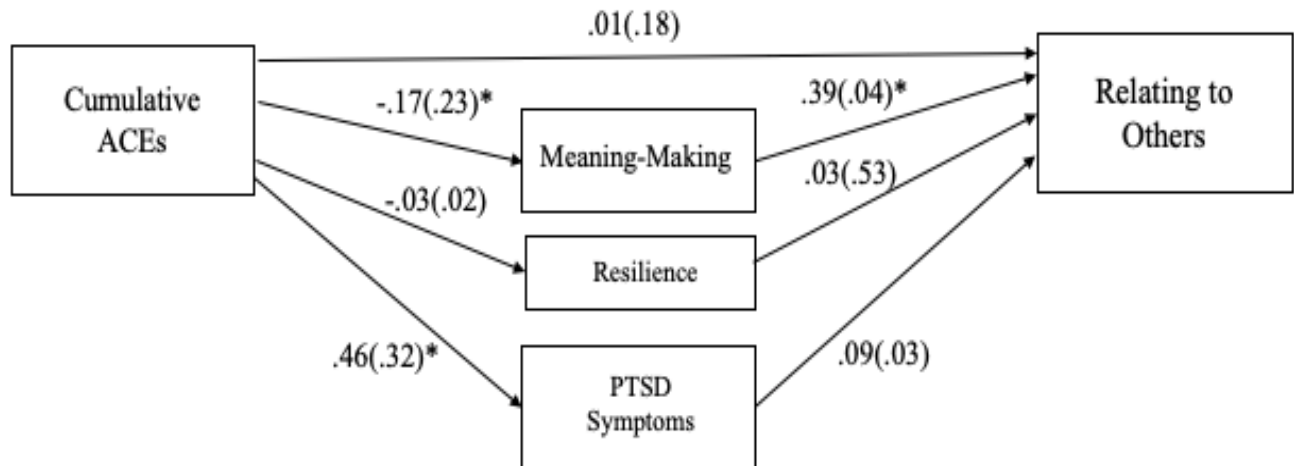
Note. N=437 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 18.** Results of Cumulative ACE and PTG Appreciation for Life Path Analytic Model



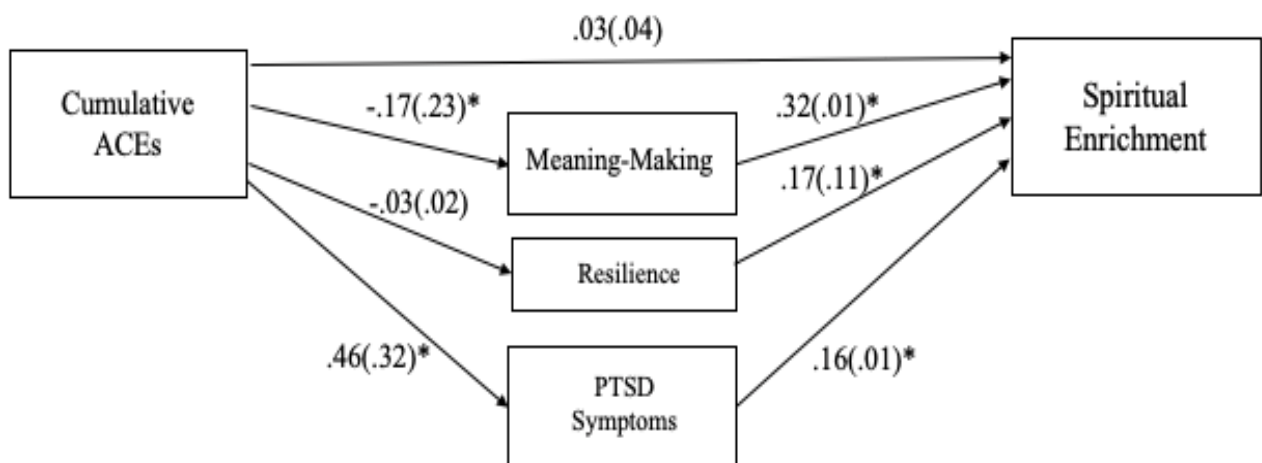
Note. N=434 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 19.** Results of Cumulative ACE and PTG Relating to Others Path Analytic Model



Note. N=438 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*

**Figure 20.** Results of Cumulative ACE and PTG Spiritual Enrichment Path Analytic Model



Note. N=440 for model. Standardized coefficients are listed with unstandardized standard errors.  $p < .05$ .\*



## Appendix B. Tables

Table 1

*Participant Demographics (N = 759)*

<b>Demographics</b>	<b>n</b>	<b>%</b>	<b><i>M (SD)</i></b>
<b>Age (Years)</b>	598	79.00	23.15 (6.81)
<b>Gender</b>	601	79.18	
Male	92	15.30	
Female	495	82.36	
Other	14	2.32	
<b>Ethnicity</b>	601	79.18	
Asian	60	9.98	
African-American	65	10.81	
Caucasian	270	44.93	
Hispanic	151	25.12	
Other	55	9.15	
<b>Socioeconomic Status/SES</b>	599	78.90	
Upper	30	5.00	
Middle	416	69.44	
Low	139	23.20	
Other	14	2.33	
<b>Education Level</b>	598	78.80	
Lower than High School	0	0.00	

High School Only	67	11.20
Post-High School	531	88.80
<b>Employment Status</b>	600	79.10
Full-Time	89	9.83
Part-Time	176	29.33
Student	288	48.00
Unemployed	47	7.83
Disabled	0	0
<b>Relationship Status</b>	600	79.10
Single	324	54.00
In a Relationship	230	38.33
Married	46	7.66
<b>Geographic Location</b>	759	100
United States of America	754	99.34
Other	5	0.66
<b>Mental Health Problems</b>	596	78.50
Yes	441	73.99
No	155	26.00
<b>Strong Social Support</b>	598	78.80
Yes	485	81.10
No	113	18.89
<b>Meaning-Making Receptivity</b>	597	78.70
Yes	482	80.73

No	115	19.27	
<b>Meaning-Making Time Post-ACE</b>	495	65.20	
Same Day	24	4.85	
Same Week	19	3.84	
Same Month	9	1.82	
Several Months Later	52	10.50	
Several Years Later	320	64.65	
<b>Cumulative ACEs</b>	495	73.64	2.75 (2.24)
<b>Post-Traumatic Growth</b>	470	61.92	8.59 (4.17)
<b>Meaning-Making</b>	473	62.32	48.66 (9.67)
<b>Resilience</b>	470	61.92	3.01 (.87)
<b>PTSD Symptoms</b>	452	59.56	34.10 (18.78)

---

Table 2

*Bivariate Correlations Between Key Study Variables and Subcomponents (N = 759).*

	1	2	2a	2b	2c	2d	2e	3	3a	3b	4	5
1. Cumulative ACEs	—											
2. Post-Traumatic Growth	<b>0.16**</b>	—										
2a. Personal Strength	0.24**	0.85**	—									
2b. New Possibilities	0.21**	0.90**	0.74**	—								
2c. Appreciation for Life	0.23**	0.85**	0.71**	0.76**	—							
2d. Relating to Others	0.02	0.88**	0.63**	0.70**	0.64**	—						
2e. Spiritual Enrichment	0.02	0.66**	0.49**	0.52**	0.50**	0.51**	—					
3. Meaning-Making	<b>-0.15**</b>	<b>0.41**</b>	0.30**	0.36**	0.31**	0.38**	0.31**	—				
3a. Presence	-0.28**	0.36**	0.28**	0.28**	0.31**	0.32**	0.27**	0.71**	—			
3b. Search	0.11*	0.18**	0.11*	0.20**	0.10*	0.17**	0.15**	0.62**	-0.12**	—		
4. Resilience	<b>-0.02</b>	<b>0.20**</b>	0.31**	0.20**	0.31**	0.05	0.15**	<b>0.13**</b>	0.28**	0.14**	—	
5. PTSD Symptoms	<b>0.46**</b>	<b>0.11*</b>	0.09	0.19**	0.31**	0.03	0.06	<b>-0.13**</b>	-0.40**	0.25**	<b>-0.35*</b>	—

*Note.* \* $p < 0.05$  \*\* $p < 0.01$ , ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder. Correlations for key study variables are listed in boldface for clarity.

Table 3

*Indirect Effects from Cumulative ACEs to PTG (N = 428)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → meaning-making → PTG	<b>-0.788</b>	[-1.282, -0.294]
2	Cumulative ACEs → resilience → PTG	-0.065	[-0.297, 0.166]
3	Cumulative ACEs → PTSD symptoms → PTG	<b>0.941</b>	[0.429, 1.453]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 4

*Indirect Effects from ACE Subtype Emotional Abuse to PTG (N = 434)*

	Indirect Pathway	Est.	95% CI
1	Emotional Abuse → meaning-making → PTG	<b>-2.297</b>	[-4.194, -0.401]
2	Emotional Abuse → resilience → PTG	-0.386	[-1.519, 0.748]
3	Emotional Abuse → PTSD symptoms → PTG	<b>5.050</b>	[2.729, 7.372]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 5

*Indirect Effects from ACE Subtype Physical Abuse to PTG (N = 434)*

	Indirect Pathway	Est.	95% CI
1	Physical Abuse → meaning-making → PTG	<b>-3.343</b>	[-5.678, -1.008]
2	Physical Abuse → resilience → PTG	-0.003	[-1.310, 1.304]
3	Physical Abuse → PTSD symptoms → PTG	<b>4.425</b>	[2.319, 6.531]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 6

*Indirect Effects from ACE Subtype Sexual Abuse to PTG (N = 431)*

	Indirect Pathway	Est.	95% CI
1	Sexual Abuse → meaning-making → PTG	1.085	[-1.220, 3.390]
2	Sexual Abuse → resilience → PTG	0.840	[-0.459, 2.139]
3	Sexual Abuse → PTSD symptoms → PTG	<b>2.357</b>	[0.709, 4.004]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 7

*Indirect Effects from ACE Subtype Emotional Neglect to PTG (N = 435)*

	Indirect Pathway	Est.	95% CI
1	Emotional Neglect → meaning-making → PTG	<b>-2.198</b>	[-4.083, -0.313]
2	Emotional Neglect → resilience → PTG	<b>-1.432</b>	[-2.708, -0.156]
3	Emotional Neglect → PTSD symptoms → PTG	<b>4.315</b>	[2.221, 6.409]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 8

*Indirect Effects from ACE Subtype Physical Neglect to PTG (N = 435)*

	Indirect Pathway	Est.	95% CI
1	Physical Neglect → meaning-making → PTG	<b>-4.183</b>	[-7.476, -0.890]
2	Physical Neglect → resilience → PTG	0.770	[-1.073, 2.612]
3	Physical Neglect → PTSD symptoms → PTG	<b>4.662</b>	[2.216, 7.107]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 9

*Indirect Effects from ACE Subtype Parental Separation to PTG (N = 435)*

	Indirect Pathway	Est.	95% CI
1	Parental Separation → meaning-making → PTG	<b>-3.335</b>	[-5.423, -1.246]
2	Parental Separation → resilience → PTG	-0.043	[-1.192, 1.106]
3	Parental Separation → PTSD symptoms → PTG	<b>1.292</b>	[0.040, 2.544]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.



Table 10

*Indirect Effects from ACE Subtype Mother Maltreatment to PTG (N = 435)*

	Indirect Pathway	Est.	95% CI
1	Mother Maltreatment → meaning-making → PTG	-2.529	[-5.703, 0.646]
2	Mother Maltreatment → resilience → PTG	1.000	[-0.647, 2.647]
3	Mother Maltreatment → PTSD symptoms → PTG	<b>3.271</b>	[1.326, 5.216]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 11

*Indirect Effects from ACE Subtype Substance Abuse to PTG (N = 435)*

	Indirect Pathway	Est.	95% CI
1	Substance Abuse → meaning-making → PTG	-1.468	[0.163, -3.529]
2	Substance Abuse → resilience → PTG	-0.485	[0.475, -1.815]
3	Substance Abuse → PTSD symptoms → PTG	<b>2.903</b>	[0.001, 1.213]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 12

*Indirect Effects from ACE Subtype Mental Illness to PTG (N = 434)*

	Indirect Pathway	Est.	95% CI
1	Mental Illness → meaning-making → PTG	-1.537	[-3.432, 0.359]
2	Mental Illness → resilience → PTG	-0.707	[-1.897, 0.482]
3	Mental Illness → PTSD symptoms → PTG	<b>3.372</b>	[1.663, 5.081]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 13

*Indirect Effects from ACE Subtype Criminal Behavior to PTG (N = 435)*

	Indirect Pathway	Est.	95% CI
1	Criminal Behavior → meaning-making → PTG	-2.082	[-5.400, 1.236]
2	Criminal Behavior → resilience → PTG	0.181	[-1.823, 2.185]
3	Criminal Behavior → PTSD symptoms → PTG	<b>2.027</b>	[0.135, 3.920]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 14

*Indirect Effects from Cumulative ACEs to PTG via Presence of Meaning (N = 428)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Presence of Meaning → PTG	<b>-1.473</b>	[-2.036, -0.910]
2	Cumulative ACEs → resilience → PTG	-0.053	[-0.237, 0.134]
3	Cumulative ACEs → PTSD symptoms → PTG	<b>1.437</b>	[0.869, 2.005]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 15

*Indirect Effects from Cumulative ACEs to PTG via Search for Meaning (N = 428)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Search for Meaning → PTG	0.163	[-0.031, 0.357]
2	Cumulative ACEs → resilience → PTG	-0.085	[-0.386, 0.216]
3	Cumulative ACEs → PTSD symptoms → PTG	<b>0.706</b>	[0.141, 1.271]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 16

*Indirect Effects from Cumulative ACEs to PTG Personal Strength (N = 439)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Meaning-Making → PS	<b>-0.116</b>	[-0.195, -0.036]
2	Cumulative ACEs → resilience → PS	-0.018	[-0.098, 0.063]
3	Cumulative ACEs → PTSD symptoms → PS	<b>0.179</b>	[0.072, 0.286]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, PS = Personal Strength, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 17

*Indirect Effects from Cumulative ACEs to PTG New Possibilities (N = 437)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Meaning-Making → NP	<b>-0.189</b>	[-0.310, -0.067]
2	Cumulative ACEs → resilience → NP	-0.017	[-0.089, 0.055]
3	Cumulative ACEs → PTSD symptoms → NP	<b>0.349</b>	[0.202, 0.495]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, NP = New Possibilities, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 18

*Indirect Effects from Cumulative ACEs to PTG Appreciation for Life (N = 434)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Meaning-Making → AL	<b>-0.114</b>	[-0.185, -0.042]
2	Cumulative ACEs → resilience → AL	-0.011	[-0.050, 0.028]
3	Cumulative ACEs → PTSD symptoms → AL	<b>0.137</b>	[0.047, 0.226]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, AL = Appreciation for Life, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 19

*Indirect Effects from Cumulative ACEs to PTG Relating to Others (N = 438)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Meaning-Making → RO	<b>-0.252</b>	[-0.421, -0.082]
2	Cumulative ACEs → resilience → RO	-0.003	[-0.018, 0.013]
3	Cumulative ACEs → PTSD symptoms → RO	0.159	[-0.035, 0.354]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, RO = Relating to Others, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

Table 20

*Indirect Effects from Cumulative ACEs to PTG Spiritual Enrichment (N = 440)*

	Indirect Pathway	Est.	95% CI
1	Cumulative ACEs → Meaning-Making → SE	<b>-0.046</b>	[-0.077, -0.015]
2	Cumulative ACEs → resilience → SE	-0.003	[-0.018, 0.011]
3	Cumulative ACEs → PTSD symptoms → SE	<b>0.061</b>	[0.020, 0.101]

*Note.* Estimates are unstandardized. Estimates with 95% CIs that did not contain a zero were considered statistically significant (Preacher & Hayes, 2008). These values are listed in boldface for clarity. ACEs = adverse childhood experiences, SE = Spiritual Enrichment, PTSD = post-traumatic stress disorder symptoms; PTG = post-traumatic growth.

**Table 21***Distribution of ACEs, Meaning-Making, and PTG Subcomponents (N = 759)*

<b>ACE Subtypes</b>	<b>%</b>
Emotional Abuse	38.30
Emotional Neglect	34.50
Mental Illness	31.20
Parental Separation	25.70
Physical Abuse	20.00
Substance Abuse	18.80
Sexual Abuse	13.30
Mother Maltreatment	9.60
Physical Neglect	7.80
Criminal Behavior	6.60
<b>Meaning-Making</b>	
Presence	62.50
Search	62.60
<b>Post-Traumatic Growth</b>	
Spiritual Enrichment	64.40
Personal Strength	63.80
Relating to Others	63.60
New Possibilities	63.50
Appreciation for Life	63.20

## Appendix C. Study Materials

### Online Consent Form

Dear \_\_\_\_\_

You are invited to participate in “The Childhood Experiences Study for Adults.” The goal of this study is to examine whether (if applicable) and what types of negative or adverse events did people experience in the first 18 years of their life, how they responded to these experiences, and their present mental health.

If you decide to participate, please complete the following set of questions. The survey is designed to explore your experiences, reactions to those experiences, and current mental health. It will take about 30 minutes to complete this survey. You will be asked to answer questions about yourself (e.g. age, gender, etc), about your childhood experiences, about your responses to these childhood experiences, and your mental health. You may not directly benefit from this research. However, we hope this research will result in a greater understanding of early life experiences and adult mental health.

Any discomfort or inconvenience to you will not be greater than you would ordinarily encounter in daily life. Data will be collected using the Internet. There are no guarantees on the security of data sent on the Internet. Confidentiality will be kept to the degree permitted by the technology used.

#### Compensation

To compensate you for the time you spend in this study, you will receive one sona credit. Your decision whether or not to participate will not affect your relationships with Montclair State University personnel.

If you decide to participate, you are free to stop at any time. You may skip questions you do not want to answer. You can leave the study at any time and will still receive the compensation promised.

Please feel free to ask questions regarding this study. If you have additional questions, you may contact me, Sowmya Kshtriya, 646-732-0493, [kshtriyas1@montclair.edu](mailto:kshtriyas1@montclair.edu), OR my faculty mentor Dr. Paul Amrhein at [amrheinp@mail.montclair.edu](mailto:amrheinp@mail.montclair.edu), Department of Psychology, MSU.

Any questions about your rights may be directed to Dr. Dana Levitt, Chair of the Institutional Review Board at Montclair State University at [reviewboard@mail.montclair.edu](mailto:reviewboard@mail.montclair.edu) or 973-655-2097.

Thank you for your time.

Sincerely,

*Sowmya Kshtriya*

*Montclair State University, Department of Psychology*

By clicking the link below, I confirm that I have read this form and will participate in the project described. Its general purposes, the particulars of involvement, and possible risks and inconveniences have been explained to my satisfaction. I understand that I can discontinue participation at any time. My consent also indicates that I am 18 years of age.

[Please feel free to print a copy of this consent.]

I agree to participate (link to survey)

I decline (link to close webpage)

The study has been approved by the Montclair State University Institutional Review Board.



## Surveys

### Demographics Information Sheet

Please answer the following questions. What is your:

- 1) **Age:** \_\_\_\_\_
- 2) **Gender:**
  - a) Male
  - b) Female
  - c) Other: \_\_\_\_\_
- 3) **Ethnicity:**
  - a) Asian
  - b) African American
  - c) Caucasian
  - d) Hispanic
  - e) Other: \_\_\_\_\_
- 4) **Socioeconomic Status**
  - a) Upper
  - b) Middle
  - c) Low
  - d) Other: \_\_\_\_\_
- 5) **Current Education Level:**
  - a) Less than High School
  - b) High School only
  - c) Post-High School
- 6) **Current employment status:**
  - a) Full-time
  - b) Part-time

- c) Student
- d) Unemployed
- e) Disabled

**7) Current relationship status:**

- a) Single
- b) In a Relationship
- c) Married

**8) Current Geographic location (country):** \_\_\_\_\_

**9) Country of citizenship/residence:** \_\_\_\_\_

**10) Have you struggled with or do you currently struggle with any mental health problems?** [Yes/No]

**11) If Yes, please briefly state what problem/s (e.g., depression, PTSD, substance use):**  
\_\_\_\_\_

**12) Do you have a strong social support system (family/friends you can go to in times of need)?** [Yes/No]

**13) Do you like to think about or understand the purpose of certain negative childhood experiences in the first 18 years of your life that caused you to suffer?** [Yes/No]

**14) If yes, how long did it take you to understand the purpose of this event after the event occurred?**

- a) Same day
- b) Same week
- c) Same month
- d) Several Months Later
- e) Several Years Later
- f) Recently

**Adverse Childhood Experiences Questionnaire (ACE)**

**In the first 18 years of your life:**

1. Did a parent or other adult in the household often swear at you, insult you, put you down, or humiliate you? Or act in a way that made you afraid that you might be physically hurt?  
[Yes/No]
2. Did a parent or other adult in the household often push, grab, slap, or throw something at you? Or ever hit you so hard that you had marks or were injured?  
[Yes/No]
3. Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way? Or Attempt or actually have oral or anal intercourse with you?  
[Yes/No]
4. Did you often feel that no one in your family loved you or thought you were important or special? Or your family didn't look out for each other, feel close to each other, or support each other?  
[Yes/No]
5. Did you often feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? Or your parents were too drunk or high to take care of you or take you to the doctor if you needed it?  
[Yes/No]
6. Was a biological parent ever lost to you through divorce, abandonment, or other reasons?  
[Yes/No]
7. Was your mother or stepmother often pushed, grabbed, slapped, or had something thrown at her? Or sometimes or often kicked, bitten, hit with a fist, or hit with something hard? Or ever repeatedly hit over at least a few minutes or threatened with a gun or knife?  
[Yes/No]
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?  
[Yes/No]
9. Was a household member depressed or mentally ill? Or did a household member attempt suicide?  
[Yes/No]
10. Did a household member go to prison?

[Yes/No]

### **Post-Traumatic Growth Inventory**

Indicate for each of the statements below the degree to which this change occurred in your life as a result of the adverse childhood experience/s you faced in the first 18 years of your life, using the following scale.

0 = I did not experience this change as a result of my crisis.

1 = I experienced this change to a very small degree as a result of my crisis.

2 = I experienced this change to a small degree as a result of my crisis.

3 = I experienced this change to a moderate degree as a result of my crisis.

4 = I experienced this change to a great degree as a result of my crisis.

5 = I experienced this change to a very great degree as a result of my crisis.

#### Possible Areas of Growth and Change

1. I changed my priorities about what is important in life. [0,1,2,3,4,5]
2. I have a greater appreciation for the value of my own life. [0,1,2,3,4,5]
3. I developed new interests. [0,1,2,3,4,5]
4. I have a greater feeling of self-reliance. [0,1,2,3,4,5]
5. I have a better understanding of spiritual matters. [0,1,2,3,4,5]
6. I more clearly see that I can count on people in times of trouble. [0,1,2,3,4,5]
7. I established a new path for my life. [0,1,2,3,4,5]
8. I have a greater sense of closeness with others. [0,1,2,3,4,5]
9. I am more willing to express my emotions. [0,1,2,3,4,5]
10. I know better that I can handle difficulties. [0,1,2,3,4,5]
11. I am able to do better things with my life. [0,1,2,3,4,5]
12. I am better able to accept the way things work out. [0,1,2,3,4,5]
13. I can better appreciate each day. [0,1,2,3,4,5]
14. New opportunities are available which wouldn't have been otherwise. [0,1,2,3,4,5]
15. I have more compassion for others. [0,1,2,3,4,5]
16. I put more effort into my relationships. [0,1,2,3,4,5]
17. I am more likely to try to change things which need changing. [0,1,2,3,4,5]
18. I have a stronger religious faith. [0,1,2,3,4,5]
19. I discovered that I'm stronger than I thought I was. [0,1,2,3,4,5]
20. I learned a great deal about how wonderful people are. [0,1,2,3,4,5]
21. I better accept needing others. [0,1,2,3,4,5]

### **Meaning-Making Questionnaire**

Please take a moment to think about what makes your life feel important to you. Please respond to the following statements as truthfully and accurately as you can, and also please remember that these are very subjective questions and that there are no right or wrong answers. Please answer according to the scale below:

1. Absolutely Untrue
2. Mostly Untrue
3. Somewhat Untrue
4. Can't Say True or False
5. Somewhat True
6. Mostly True
7. Absolutely True

1. I understand my life's meaning. [1,2,3,4,5,6,7]
2. I am looking for something that makes my life feel meaningful. [1,2,3,4,5,6,7]
3. I am always looking to find my life's purpose. [1,2,3,4,5,6,7]
4. My life has a clear sense of purpose. [1,2,3,4,5,6,7]
5. I have a good sense of what makes my life meaningful. [1,2,3,4,5,6,7]
6. I have discovered a satisfying life purpose. [1,2,3,4,5,6,7]
7. I am always searching for something that makes my life feel significant. [1,2,3,4,5,6,7]
8. I am seeking a purpose or mission for my life. [1,2,3,4,5,6,7]
9. My life has no clear purpose. [1,2,3,4,5,6,7]
10. I am searching for meaning in my life. [1,2,3,4,5,6,7]

**Brief Resilience Scale**

Please answer according to the scale below:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. I tend to bounce back quickly after hard times. [1,2,3,4,5]
2. I have a hard time making it through stressful events. [1,2,3,4,5]
3. It does not take me long to recover from a stressful event. [1,2,3,4,5]
4. It is hard for me to snap back when something bad happens. [1,2,3,4,5]
5. I usually come through difficult times with little trouble. [1,2,3,4,5]
6. I tend to take a long time to get over set-backs in my life. [1,2,3,4,5]

### PTSD Checklist for DSM-5

Below is a list of problems that people sometimes have in response to a very stressful childhood experience that occurred in the first 18 years of life. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month, according to the scale below:

1. Not At All
2. A Little Bit
3. Moderately
4. Quite A Bit
5. Extremely

In the past month, how much were you bothered by:

1. Repeated, disturbing, and unwanted memories of the stressful experience? [1,2,3,4,5]
2. Repeated, disturbing dreams of the stressful experience? [1,2,3,4,5]
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)? [1,2,3,4,5]
4. Feeling very upset when something reminded you of the stressful experience? [1,2,3,4,5]
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)? [1,2,3,4,5]
6. Avoiding memories, thoughts, or feelings related to the stressful experience? [1,2,3,4,5]
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)? [1,2,3,4,5]
8. Trouble remembering important parts of the stressful experience? [1,2,3,4,5]
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)? [1,2,3,4,5]
10. Blaming yourself or someone else for the stressful experience or what happened after it? [1,2,3,4,5]
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame? [1,2,3,4,5]
12. Loss of interest in activities that you used to enjoy? [1,2,3,4,5]
13. Feeling distant or cut off from other people? [1,2,3,4,5]
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)? [1,2,3,4,5]
15. Irritable behavior, angry outbursts, or acting aggressively? [1,2,3,4,5]
16. Taking too many risks or doing things that could cause you harm? [1,2,3,4,5]
17. Being “super alert” or watchful or on guard? [1,2,3,4,5]
18. Feeling jumpy or easily startled? [1,2,3,4,5]
19. Having difficulty concentrating? [1,2,3,4,5]
20. Trouble falling or staying asleep? [1,2,3,4,5]

## Online Debriefing Form

*You have successfully completed this study. Thank you for participating in this study!*

**This handout was made to tell you what this study is about. If you have any more questions, please let us know. Please read below with care. You can ask questions at any time, now or later.**

**Title:** The Childhood Experiences Study for Adults

**Study Number:** FY-17-18-\_\_\_\_ or L-00\_\_\_\_\_

### **Purpose of the study**

The goal of this study is to examine whether (if applicable) and what types of negative or adverse events did people experience in the first 18 years of their life, how they responded to these experiences, and their present mental health.

In this study, you completed a series of self-report measures. The Demographics Information Sheet was used to collect basic information about you. The Adverse Childhood Experiences (ACEs) Questionnaire was used to primarily collect data on personally witnessed adverse experiences in the first 18 years of your life. We were interested in looking at 10 types of ACEs ranging under the categories of Abuse, Neglect, and Household Dysfunction. You also answered questions about whether you have felt symptoms related to PTSD in recent times. The purpose of those survey questions from the PTSD Checklist for DSM-5 was to measure your mental health trajectory of PTSD in adulthood. The other three questionnaires were mainly trying to capture your positive responses to the early childhood events you had indicated. The Post-Traumatic Growth Inventory was used to primarily collect data on five dimensions of growth in your life post-ACE/s that included I: Relating to Others, II: New Possibilities, III: Personal Strength, IV: Spiritual Change, and V: Appreciation of Life. The Meaning-Making Questionnaire was used to examine whether you found or are still searching for the purpose behind why you experienced certain ACE/s in the first 18 years of your life. The Brief Resilience Scale was used to examine your ability to bounce back post-ACE/s.

If you want to know the results of this study, please call Sowmya Kshtriya (646-732-0493) at Montclair State University, Department of Psychology. The results may not be ready until 2022, but we would be happy to send you information after that time.

### **Who will know that you are in this study?**

All information will remain confidential and anonymous.

### **Do you have any questions about your rights as a research participant?**

Phone or email the IRB Chair, Dr. Dana Levitt, at 973-655-2097 or [reviewboard@montclair.edu](mailto:reviewboard@montclair.edu).

It is okay to use my data in other studies:

Please initial: \_\_\_\_\_ Yes \_\_\_\_\_ No

**Thank you very much for your help! We realize it takes not only time and effort, but an openness to reflect and recall past events, thoughts, and feelings. We are extremely grateful and hope to combine responses across individuals such as yourself to improve our overall understanding of adverse childhood events. This research would not be possible without help from individuals such as yourself. Thank you ☺**