Adverse Childhood Experiences and Familial Factors in Adolescent Suicidality

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Purpose: Adverse childhood experiences (ACEs) are risk factors for adolescent suicidal ideation (SI), but the influence of immediate family factors on this association remains understudied. This study examines how family functioning (FF) and perceived parental criticism (PPC) moderate the relationship between ACEs and SI. **Methods:** 46 community-based adolescents between the ages of 15 and 19 (M_{age} = 17.43 years, 69.57% female) participated in a study examining cognitive risk factors for SI. Several self-report measures were administered: the Suicidal Ideation Questionnaire to assess SI severity, the Adverse Childhood Experiences Questionnaire to measure ACEs, the McMaster Family Assessment Device – General Functioning Scale to evaluate FF, and the Perceived Criticism Measure to determine PPC. **Results:** Neither the presence ($ß$ = .26, p = .09) nor the count of ACEs ($ß$ = .24, p = .12) significantly predicted SI severity. SI severity was significantly associated with specific ACEs such as emotional abuse, emotional neglect, and mental illness or suicide attempts in the household ($ß$ = .39-.65, p = .00-.04), but not with others ($ß$ = -.21-.40, p = .08-.99). Furthermore, FF ($ß$ = .28, p < .01) and PPC ($ß$ = .19, p = .04) independently moderated the association between ACEs and SI severity, while their combined interaction was not significant ($ß$ = -.03, p = .74). **Conclusion:** Specific ACEs predicted SI severity. Moreover, lower FF and higher PPC independently amplified the impact of ACEs on SI severity in adolescents, highlighting the need for interventions that enhance FF and address PPC to mitigate adolescent suicide risk.
Keywords: Suicide, Adolescent, Adverse Childhood Experiences, Family Functioning, Perceived Parental Criticism

Suicide is a major public health concern across the lifespan (Centers for Disease Control and Prevention [CDC], 2023). In particular, adolescents between the ages of 10 and 19 are especially vulnerable, with suicide ranking as the second leading cause of death in this age group in the United States (American Academy of Child and Adolescent Psychiatry [AACAP], 2019). In this developmental stage, parents or primary caregivers have a unique psychosocial influence, as children are legally, emotionally, and developmentally dependent on them (Armsden & Greenberg, 1987; Delgado et al., 2022; Moretti & Peled, 2004). For this reason, when examining adolescent suicidal thoughts and behaviors (STBs; e.g., suicide attempts, suicidal ideation, and suicide plan), familial factors are often considered (Cha et al., 2018; Shain et al., 2016; Wang et al., 2022). Furthermore, efforts are often made to include parents and families in treating depressed and suicidal youth, and parents can play a key role in connecting youth with mental healthcare services (Adrian et al., 2023; Curry, 2001; Diamond et al., 2003; Sander & McCarty, 2005).

Suicide is a multifaceted phenomenon shaped by the interplay of diverse risk and protective factors (De Berardis et al., 2018). Among various risk and protective factors, the current study focuses on the following: suicidal ideation (SI), adverse childhood experiences (ACEs), family functioning (FF), and perceived parental criticism (PPC).

Suicidal Ideation

Suicidal ideation (SI) refers to the contemplation of suicide with or without the intent, or hope for death by self-inflicted means (De Leo et al., 2021). Individuals experiencing SI may have varying degrees of intensity and frequency in these thoughts, ranging from fleeting wishes to die without the intention of engaging in corresponding behaviors (i.e., passive SI) to current, persistent, suicidal thoughts with detailed plans (i.e., active SI; Harmer et al., 2024). This construct is a well-established risk factor for suicide and is prevalent among youth (Buitron et al., 2016; Chu et al., 2015; Saffer et al., 2015). Specifically, approximately 22% of female and 12% of male high school students in the United States have contemplated suicide (Kann et al., 2018). While some research suggests that SI alone (i.e., SI without specific plans, intent, actual preparatory behaviors, or access to lethal means) may not indicate high suicide risk (Joiner et al., 2003), it remains a significant risk factor as individuals who have expressed thoughts of killing oneself has a higher risk of completing suicide than people who had not (Hubers et al., 2018). Thus, the severity of SI plays a crucial role in risk formulation for both adolescents and adults.

Adverse Childhood Experiences

Adverse childhood experiences (ACEs) refer to potentially traumatic and stressful life events or circumstances

that occur during childhood or adolescence, which can have lasting negative effects on an individual's well-being (Sahle et al., 2022). These adverse experiences typically encompass various events that can be classified into three categories: abuse (i.e., physical, emotional, or sexual), neglect (i.e., physical or emotional), and household dysfunction (i.e., substance abuse or mental health issues in the family, domestic violence, incarceration, or parental separation; Sahle et al., 2022). The association between ACEs and the severity of SI and suicide attempts has been consistently demonstrated in both community and high-risk adolescent samples (Dunn et al., 2013; Miller et al., 2013; Sahle et al., 2017).

In a nationally representative sample of 10,914 participants, the cumulative lifetime counts of ACEs influenced the prevalence of SI and suicide attempts in adulthood (Thompson & Kingree, 2022). Specifically, one ACE increased the odds of endorsing active SI by 1.5 times, two ACEs increased the odds of SI by 2 times and a suicide attempt by 3 times, and three ACEs increased the odds of SI by 3 times and a suicide attempt by 5 times. Notably, interventions such as parenting education, mental health counseling, social service referrals, and social support are shown to effectively reduce behavioral and mental health problems in children who have experienced such potentially traumatic events (Marie-Mitchell & Kostolansky, 2019).

Family Functioning

Various family-related variables have been recognized as both protective and risk factors in adolescent suicidality (Wang et al., 2022). Family cohesion and the adolescent-parent connection were identified as protective factors against the current SI turning into later suicide attempts (Shain et al., 2016; Sun et al., 2020). In a study involving 852 Chinese outpatient adolescents and adults, parental emotional warmth and less punitive mothers were recognized to be protective against the development of STBs (Wang et al., 2022).

On the contrary, negative family functioning (FF), impaired parent-child relationships, family breakdown, low paternal attachment, apathetic and severe child-rearing style, adolescents not talking to family adults about concerns, domestic violence, arguing at home, low familial adaptability and cohesion, and low parental care have been identified as significant risk factors (Ohtaki et al., 2019; Saffer et al., 2015; Shain et al., 2016; Sheftall et al., 2013; Wang et al., 2022;; Weissinger et al., 2023). Among 5,557 adolescents in Hong Kong aged 11 to 18, lower levels of family functioning and parent–adolescent communication were significantly associated with depression and suicidal ideation (Kwok & Shek, 2011). Notably, the improvement of interpersonal relation-

ships with family members has been identified as a helpful recovery factor following SI (Grimmond et al., 2019).

Perceived Parental Criticism

Perceived parental criticism (PPC) is a construct in expressed emotion literature (i.e., critical or hostile attitudes expressed by family members or caregivers toward a person with a psychiatric disorder) that has a crucial role in family relationships (Hooley & Miklowitz, 2017). In adolescents, PPC captures how much parental criticism is perceived, internalized, and affects the individual. It is hypothesized that PPC has an impact on SI and suicide attempts through its connection to constructs in the interpersonal theory of suicide (Chu et al., 2017), such as thwarted belongingness or perceived burdensomeness (Hagan & Joiner, 2017).

Adolescence, a developmental stage from ages 10 to 19, is characterized by the emergence of independence, the development of sexuality, the formation of new meaningful relationships, and accompanying vulnerabilities (Berenbaum et al., 2015; Remschmidt, 1994; World Health Organization [WHO], 2025). During this crucial and delicate period, adolescents' sensitivity to parental criticism may intensify their feelings of loneliness or distort their perception of their worth to others. For instance, when parental criticism is interpreted as rejection or disapproval of their inherent value, it can undermine their sense of belonging within the family. Moreover, if adolescents begin to view themselves as a burden as a result of PPC, this perception may reinforce feelings of burdensomeness, increasing the risk of suicidal ideation or self-destructive behaviors. Thus, the importance of protective social networks and trusted adults during this period has been highlighted by many (Pringle et al., 2018).

However, there are conflicting findings on the association between PPC and suicidality. Some studies report PPC as a significant indicator of depression, SI, and suicide attempt (Hagan & Joiner, 2017; Muyan & Chang, 2015; Rapp et al., 2021; Wang et al., 2017), while others suggest that PPC only has an indirect effect on non-suicidal self-injury (NSSI) through self-criticism (Baetens et al., 2015), or find no significant association between NSSI and PPC altogether (Daly & Willoughby, 2019). Further investigation is warranted to clarify the association between PPC and adolescent suicidality.

Aims and Hypotheses

Previous research has established that SI, ACEs, FF, and PPC individually contribute to adolescent suicidality. Although the predictive relationship between ACEs and SI is well established, the moderating influence of FF and PPC on this association remains largely unexplored. By delving into the moderating effects of FF and PPC, we aim to identify

nuanced pathways through which ACEs may or may not translate into SI later in adolescence. Since the family environment plays a pivotal role in adolescents' emotional and psychological development, investigating these interactions can offer insights into how familial factors exacerbate or mitigate the risk of adolescent suicidality in the presence of ACEs.

Thus, the current study examines how ACEs predict the severity of SI in adolescents, and to what extent this association is moderated by FF and PPC. Understanding this intricate relationship may offer valuable insights into protective and risk factors of adolescent suicidality, contributing to the design of targeted interventions and support systems for at-risk youth.

First, this study will investigate the association between ACEs and the severity of SI in adolescents, positing the following hypotheses: Hypothesis 1a: Adolescents with at least one ACE will endorse a higher severity of SI than those without ACEs. Hypothesis 1b: Subcategories of ACEs will correspond with SI severity in adolescents, such that those adolescents with a history of each type of ACE report more severe SI than their respective non-ACE comparison group. Hypothesis 1c: A higher count of ACEs will predict a higher severity of SI in adolescents.

Second, the moderating effects of FF and PPC on the association between ACEs and the severity of SI in adolescents will be examined. The following hypotheses are posited: Hypothesis 2a: ACEs will be more strongly associated with SI severity among adolescents with lower FF. Hypothesis 2b: ACEs will be more strongly associated with SI among adolescents with higher PPC. Hypothesis 2c: ACEs will be more strongly associated with SI among adolescents with higher PPC and lower FF.

Methods

Sample

Participants were recruited from the urban community in the greater New York metropolitan area via in-person (e.g., street fairs and flyers) and online (e.g., social media advertisement and ResearchMatch) recruitment efforts for a study examining cognitive risk factors associated with SI. Post-baccalaureate- and masters-level research assistants conducted screenings via phone to determine eligibility. Eligibility was determined based on the presence of STBs in adolescence, while (1) challenges in the adolescent's and parent/guardian's understanding of informed consent and study procedure, (2) self-disclosure of immediate suicidal intent, (3) the occurrence of violent and agitated behaviors, (4) limited proficiency in the English language, and (5) psychiatric symptoms of adolescents which would hinder consent or participation in the study were used as grounds for exclusion.

Out of 176 community-based adolescents who enrolled in the study, 46 completed the Adverse Childhood Experience Questionnaire (ACE-Q). Relatively few adolescents completed the ACE-Q because its administration was discontinued mid-study in an effort to shorten the baseline protocol. Thus, only this subgroup of adolescents ($n = 46$) between the ages of 15 and 19 ($M_{age} = 17.43$ years, 69.6% female; Table 1) was analyzed. The participants were racially diverse, with 45.7% identifying as white, 23.9% identifying as Black or African American, 21.7% identifying as Asian, and 4.3% identifying as multiracial or other. Additionally, 17.4% of the adolescents identified as Hispanic. The majority (67.4%) of the adolescents reported heterosexual sexual orientation, followed by bisexual (19.6%), homosexual (8.7%), questioning (2.2%), and other (2.2%).

Measures

Suicidal Ideation Questionnaire (SIQ)

The severity of both passive and active suicidal ideation in adolescents over the past month was assessed using the SIQ (Reynolds, 1987), a 30-item self-report measure rated on a seven-point Likert scale (0 = "I never had this thought," 6 = "Almost every day"). An elevated score on the SIQ suggests a frequent and pervasive presence of SI (Boege et al., 2014). The SIQ is scored by summing responses to each question, and a score of 41 or higher is considered clinically significant. The SIQ was validated among 226 adolescents aged 13 to 18 years, with a Cronbach's $\alpha = .98$ (Pinto et al., 1997).

Adverse Childhood Experiences Questionnaire (ACE-Q)

The ACE-Q (Felitti et al., 1998) was administered to assess and quantify adverse or traumatic experiences encountered throughout the participants' lifetime. The ACE-Q consists of 10 yes-no items and addresses the following domains: emotional, physical, and sexual abuse, emotional and physical neglect, parental separation, domestic violence, household substance abuse, mental illness or suicide attempts in the household, and incarceration of family members. Moreover, scores of four or higher (i.e., the presence of four or more distinct ACEs) are deemed clinically significant. A high ACE-Q score has been associated with an increased risk for depression, suicide attempts, smoking, drug abuse, adolescent pregnancy, and impaired work performance in adulthood (Anda et al., 2004; Dube et al., 2003; Edwards et al., 2007; Felitti et al., 1998; Hillis et al., 2004). This questionnaire has been validated among 79 adolescents, with intraclass correlation coefficient values exceeding or being equal to .65 (i.e., good to excellent agreement) across all 10 items (Pinto et al., 2014).

McMaster Family Assessment Device – General Functioning Scale (FAD-GF)

The McMaster Family Assessment Device (FAD; Epstein et al., 1983) is a 60-item self-report questionnaire that assesses an individual's perception of their family across domains of problem-solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning. Each item is scored on a four-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." In the current study, only 12 questions from the general functioning domain were utilized to gauge adolescents' perceptions of how their families work together on essential tasks (Byles et al., 1988). Lower scores on the FAD-GF indicate better general FF, and it has been validated for standalone use in 1,869 families with children between 4 to 16 years of age (Cronbach's α = .86; Byles et al., 1988).

Perceived Criticism Measure (PCM)

Two items from the Perceived Criticism Measure (PCM; Hooley & Teasdale et al., 1989) were employed to assess adolescent's PPC (i.e., "*How critical do you think your parent or guardian is of you?*" and "*When your parent or guardian criticizes you, how upset do you get?*"). Each item is scored on a 10-point Likert scale ranging from "not at all critical" to "very critical." Responses to these two items were summed to derive the total PCM score for analysis. The PCM has robust test-retest reliability (r = .75) over a five-month period (Hooley & Teasdale et al., 1989). Some argue that the construct and assessment of the PCM merely reflect negatively biased perceptions influenced by individuals' moods. However, it was observed that the PCM scores did not change significantly after successful positive and negative mood inductions in 150 undergraduate students (r = -.12 and r = -.09, respectively; Gerlsma et al., 2014).

Procedure

Adolescents and their families who met the eligibility criteria participated in assessments during an initial laboratory visit and subsequent follow-up evaluations conducted online via email at 3 and 6 months. Compensation included a $35 gift card for baseline assessments, with opportunities to win $50 and $100 gift cards in raffles for completing the 3- and 6-month follow-ups, respectively. Notably, the final 18.75% of the total 176 participants (n = 33) completed baseline visits virtually due to the impact of the COVID-19 pandemic. Furthermore, suicidal participants who were recruited during the pandemic indicated elevated levels of SI severity when contrasted to suicidal participants recruited before the onset of the pandemic (R^2 = .04; p = .04). However, data collection for the 46 participants under examination in this study occurred before the pandemic, with the last participant completing the baseline visit on December 8th, 2018. Thus, this difference in the severity of SI in suicidal adolescents did not impact current analyses. All study procedures were approved by the Institutional Review Board at Teachers College, Columbia University.

Statistical Analyses

All analyses were conducted with Statistical Package for the Social Sciences (SPSS; version 29; IBM SPSS Inc., Chicago, Illinois).

Linear Regression

To examine whether adolescents with at least one ACE will endorse a higher severity of SI than those without ACEs (Hypothesis 1a), linear regression was utilized. Given the slightly right-skewed distribution of both SI and ACEs, linear regression was chosen for analysis due to its robustness against mild violations of assumptions (Ernst & Albers, 2017). Adolescents with a score of one or more on the ACE-Q were assigned to the *ACEs group*, while those with a score of zero on the ACE-Q were assigned to the *non-ACES group*. Subsequently, the analysis was completed while examining this dichotomous classification of ACEs as an independent variable and the severity of SI as a dependent variable.

Furthermore, linear regression was employed to examine whether subcategories of ACEs corresponded with SI severity in adolescents, such that adolescents with a history of each type of ACE reported more severe SI than their respective non-ACE comparison group (Hypothesis 1b). 10 discrete linear regressions were conducted between individual items in ACE-Q and the severity of SI. Linear regression was employed once more to assess whether a higher count of ACEs predicted a higher severity of SI in adolescents (Hypothesis 1c). This potential predictive relationship was assessed by examining the total score of ACE-Q as an independent variable and the total score of SIQ as a dependent variable.

Moderation Analysis

PROCESS Macro version 4.2 (Hayes, 2022) was used to conduct moderation analysis while examining ACEs as an independent variable, severity of SI as a dependent variable, and FF and PPC as discrete and composite moderators. PROCESS is an observed variable, Ordinary Least Squares (OLS), and logistic regression path analysis modeling tool, often used in the fields of social, business, and health sciences. It supports both mediation and moderation analyses by generating 5000 bootstrapped samples, automatically mean-centering continuous variables, establishing product terms, and presenting confidence intervals.

Results

Demographic Characteristics

Participants with at least one ACE accounted for approximately 67% ($n = 31$) of the sample. Furthermore, around 13% ($n = 6$) of the sample indicated experiencing four or more ACEs (i.e., clinically significant levels) in their lifetime. In terms of ACEs, this sample was representative of the population as approximately 64% of U.S adults report having at least one ACE, and 17% report having four or more ACEs (Swedo et al., 2023).

Hypothesis 1a: Adolescents with at least one ACE will endorse a higher severity of SI than those without ACEs.

There was no significant association between the history of ACE (i.e., presence of at least one ACE vs. no ACE) and SI severity ($ß = 0.26$, $p = .09$).

Hypothesis 1b: Subcategories of ACEs will correspond with SI severity in adolescents, such that those adolescents with a history of each type of ACE report more severe SI than their respective non-ACE comparison group.

Out of 10 subcategories of ACEs measured by ACE-Q, a significant regression was found in emotional abuse ($ß = 0.49$, $p = .01$; Table 2), emotional neglect ($ß = 0.65$, $p < .001$), and mental illness or suicide attempt in the household ($ß = 0.39$, $p = .04$) with severity of SI. For emotional abuse, $R^2 = 0.24$, indicating that emotional abuse explained approximately 24% of the variance in SI severity. In the case of emotional neglect, $R^2 = 0.43$, signifying that approximately 43% of the variability in SI severity can be accounted for by emotional neglect. For mental illness or suicide attempt in the household, $R^2 = 0.15$, indicating that being in a household with a family member who has a mental illness or who has made a suicide attempt explained 15% of the variance in SI severity. On the contrary, no significant regression was observed for physical abuse ($ß = 0.37$, $p = .08$), sexual abuse ($ß = 0.40$, $p = .09$), physical neglect ($ß = 0.22$, $p = .40$), parental separation ($ß = -0.02$, $p > .99$), witnessing domestic violence ($ß = 0.29$, $p = .20$), household substance and alcohol abuse ($ß = -0.21$, $p = .40$), and incarceration of household members ($ß = 0.39$, $p = .10$).

Hypothesis 1c: A higher count of ACEs will predict a higher severity of SI in adolescents.

There was no significant association between the count of ACEs and the severity of SI in adolescents ($ß = 0.24$, $p = .12$).

Hypothesis 2a: ACEs will be more strongly associated with SI severity among adolescents with lower FF.

The moderation analysis revealed that approximately 68% of the variability in SI severity in adolescents was predicted by ACEs and FF ($R^2 = 0.68$, $F(3, 20) = 13.90$, $p < .001$; Table 3). Additionally, the results indicated that ACEs ($ß = 0.21$, $p = .04$) had a significant positive effect on SI severity. While FF did not have significant effects on SI severity independently ($ß = 0.19$, $p = .12$), it was revealed that there was a significant interaction between ACEs and FF ($ß = 0.28$, $p < .01$). This significant interaction indicated that FF moderated the effect of ACEs on SI severity.

This moderating effect is displayed in Figure 1. The graph demonstrates that the association between ACEs and SI severity is stronger for adolescents with lower FF ($ß = 0.49$, $p < .01$; Table 4), and weaker for adolescents who have moderate FF ($ß = 0.20$, $p = .04$). Furthermore, the graph suggested that ACEs had a negative impact on the severity of SI for adolescents with high FF. Specifically, adolescents in the high ACEs group within the high FF category endorsed lower SI than those in the low ACEs group. However, this decline in SI within the high FF group was not found to be statistically significant upon further investigation ($ß = -0.08$, $p = .46$). In interpreting this result, it should be noted that a significant correlation was found between ACEs and FF ($r(25) = .48$, $p = .02$). Upon further investigation, it was revealed that only one subcategory of ACEs was correlated to FF (i.e., emotional abuse; $r(23) = .55$, $p < .01$). To address the potential issues of multicollinearity both ACEs and FF were mean-centered. This pre-processing step aimed to reduce the correlation between ACEs and FF, enhancing the precision of the results and contributing to a more reliable examination of their relationship (Iacobucci et al., 2017).

Hypothesis 2b: ACEs will be more strongly associated with SI among adolescents with higher PPC.

Approximately 47% of the variability in SI severity in adolescents was predicted by ACEs and PPC ($R^2 = 0.47$, $F(3, 22) = 6.42$, $p < .01$; Table 3). The results indicated that both ACEs ($ß = 0.48$, $p < 001$) and PPC ($ß = 0.29$, $p = .02$) had a significant positive effect on SI severity. Furthermore, there was a significant interaction between ACEs and PPC ($ß = 0.19$, $p = .04$), indicating that PPC moderated the effect of ACEs on the severity of SI. Figure 2 visualizes this interaction. The prevalence of ACEs exhibited a significant positive impact on the severity of SI within all three groups of PPC, with the most pronounced association observed among adolescents with high PPC ($ß = 0.67$, $p < .01$; Table 5). A less pronounced association was observed for adolescents with moderate levels of PPC ($ß = 0.47$, $p < .001$), followed by adolescents with low PPC ($ß = 0.28$, $p = .01$). A significant correlation between ACEs and PPC was not observed ($r(23) = -0.29$, $p = .15$).

Hypothesis 2c: ACEs will be more strongly associated with SI among adolescents with higher PPC and lower FF.

This model explained approximately 72% of the variability in SI severity ($R^2 = 0.72$, $F(4, 19) = 5.89$, $p < .01$; Table 3). The analysis revealed that ACEs ($\beta = 0.18$, $p = .38$), PPC ($\beta = 0.12$, $p = .29$), and FF ($\beta = 0.17$, $p = .41$) did not have a significant independent effect on the severity of SI. Interactions between ACEs x PPC ($\beta = -0.11$, $p = .41$), PPC x FF ($\beta = 0.06$, $p = .64$), and ACEs x PPC x FF ($\beta = -0.03$, $p = .77$) were also not found to be significant. Nonetheless, the interaction between ACEs and FF remained significant ($\beta = 0.32$, $p = .02$).

The interactions are visualized in Figure 3. The figure showed that ACEs had a negative impact on the severity of SI for adolescents with high FF, irrespective of varying levels of PPC. However, upon further investigation, these interactions were not significant (i.e., High FF x Low PPC ($\beta = -0.06$, $p = .72$; Table 6), High FF x Moderate PPC ($\beta = -0.15$, $p = .60$), High FF x High PPC ($\beta = -0.23$, $p = .58$). Lastly, out of nine slopes visualized in Figure 3, two showed significant associations: Low PPC x Low FF ($\beta = 0.64$, $p = .01$; Table 6) and Moderate PPC x Low FF ($\beta = 0.50$, $p = .01$).

Discussion

The current study examined how ACEs predict the severity of SI in adolescents, and to what extent this relationship was moderated by familial factors such as FF and PPC. The results indicated that low FF and high PPC independently exacerbated the impact of childhood adversity on the severity of adolescent SI. This moderating effect, however, was not observed when examining FF and PPC compositely. Furthermore, specific forms of ACEs were significantly associated with the severity of SI in adolescents. Nonetheless, the presence and counts of ACEs were not significantly associated with the severity of SI.

Moderating Role of FF and PPC

As hypothesized, ACEs were more strongly associated with SI among adolescents who had lower FF. This finding suggests that the combined impact of ACEs and lower FF exacerbates the risk of SI in adolescents. Visualizing the moderating effects of FF revealed intriguing patterns (Figure 1). Prior to conducting post hoc analysis, positive associations between the count of ACEs and severity of SI were expected for all three groups of FF (i.e., low, moderate, and high). Indeed, this pattern was observed among adolescents in both low- and moderate-FF groups.

Although the impact was more pronounced in the low FF group than the moderate FF group, this finding indicated that adolescents with moderate FF face comparable risks to those with low FF. Given that not talking to family adults about concerns or lacking a trusted adult in one's life has been linked to an elevated risk of teen suicidality (Weissinger et al., 2023), it is plausible that adolescents from families with low and moderate functioning may not perceive their parents or guardians as trusted adults with whom they can discuss concerns when experiencing potentially traumatic life events. This inability to openly share the experiences of adverse events could exacerbate SI among adolescents and prevent them from receiving timely and appropriate help.

In contrast, the opposite trend was observed in the high FF group; the severity of SI decreased as the count of ACEs increased. This unanticipated trajectory can be attributed to several plausible explanations. In families with high FF, children may generally perceive their parents or guardians as trusted adults and be more inclined to seek help from them when faced with potentially traumatic events. Additionally, families characterized by high general FF may be better equipped to provide appropriate assistance when adolescents experience crises and reach out for help. Adolescents' willingness to seek help, coupled with the family's competency in providing necessary support, may act as a buffer against the exacerbation of SI associated with childhood adverse events.

Furthermore, the increased severity of SI observed in adolescents with fewer ACEs within the high FF group could be attributed to these adolescents perceiving their few ACEs as not substantial enough to justify seeking help, despite the less apparent but surely debilitating negative consequences of ACEs. As the count of ACEs rises, adolescents may feel more justified and validated in seeking support from their families, which can diminish the detrimental effects of ACEs. However, the downward trend observed in the high FF group should be interpreted with caution, as the slopes are not statistically significant (Table 4).

As predicted, ACEs were more strongly associated with SI among adolescents with higher PPC. This finding suggests that the risk of SI is exacerbated when ACEs are conjoined with a higher level of adolescents' perception of parental criticism. As visualized in Figure 2, across all varying levels of PPC, the severity of SI increased as ACEs experienced by adolescents increased. The most prominent association was observed in the high PPC group, followed by the moderate, and then the low PPC groups.

There may be several reasons why higher levels of PPC intensify the association between adverse events in childhood and SI in adolescence. Parental criticism is associated with the development of internalizing symptoms (i.e., sadness, anxiety, and loneliness) in children (Ahmadzadeh et al., 2022; Ehrenreich & Underwood, 2016). In a longitudinal study conducted by Piqueras and colleagues (2019), inter-

nalizing symptoms (e.g., symptoms of depression) had a significant association with current suicidal behaviors in 239 adolescents. Given this body of research, it can be speculated that persistent parental criticisms may significantly shape adolescents' self-perception. The internalization of critical messages from a caregiver may lead to the cultivation of a more pessimistic self-view. This curtailed self-esteem in youth may intensify feelings of thwarted belongingness and perceived burdensomeness (Eades et al., 2019). Thus, adolescents may experience heightened feelings of isolation and a diminished sense of emotional support from their parents. Consequently, both thwarted belongingness and perceived burdensomeness can compound emotional distress, amplifying the impact of ACEs and further elevating the risk of adolescent STBs (Ogrodniczuk et al., 2023; Roeder & Cole, 2019).

Given that PPC is a construct designed to gauge adolescents' perception of parental criticism, there is ambiguity regarding its direct correlation with the frequency or actual intensity of criticism received. It is conceivable that PPC does not solely reflect the objective frequency or severity of parental reproach, but rather encompasses a subjective element influenced by individual interpretations. This suggests that certain adolescents may be more prone to interpreting their parents' feedback as highly critical, irrespective of the actual tone or intention of such expressions. Likewise, it is plausible that certain adolescents exhibit greater resilience in the face of potentially unwarranted and harsh parental criticism. While PPC captures external factors (i.e., how critical the parents are), it also encompasses the subjective filters through which adolescents interpret and process parental behaviors.

Finally, there was insufficient evidence to conclude that FF and PPC compositely moderate the association between ACEs and adolescent SI. Thus, we could not conclude that ACEs are more strongly associated with SI among adolescents with both lower FF and higher PPC. Since FF and PPC independently moderated the association between ACEs and adolescent SI, the absence of a significant result in evaluating FF and PPC as composite moderators raises questions. Potentially, the interplay between FF, PPC, ACEs, and SI may have been more complex than initially hypothesized. It is also possible that other variables or interactions that were not accounted for in the study design could have contributed to the observed outcomes.

In this composite model, while all other interactions were not significant, the interaction between ACEs and FF remained significant, once again validating the finding in Hypothesis 2a. This finding becomes clearer when inspecting Figure 3. Among the nine interactions depicted in the figure, statistical significance was exclusively observed in the interactions involving the low FF group (i.e., low FF x low PPC and low FF x moderate PPC). This illustrates the pivotal role of FF as a moderating variable in the complex interplay between adverse events in childhood and SI in adolescence.

Moreover, the intriguing pattern depicted in Figure 1 reemerged in Figure 3. The figure displayed that ACEs had a negative impact on the severity of SI for adolescents with high FF, irrespective of varying levels of PPC. Once again, this suggested that adolescents in the high ACEs group with high FF endorsed lower SI than those in the lower ACEs group. While these interactions were not significant (Table 6), this recurring trend warrants further investigation.

Association Between ACEs and SI

Select forms of childhood adversity were associated with the severity of SI in adolescents. These include emotional abuse, emotional neglect, and mental illness or suicide attempts in the household. In contrast, physical abuse, sexual abuse, physical neglect, parental separation, witnessing domestic violence, household substance and alcohol abuse, and incarceration of household members did not correspond to SI severity in adolescents. This finding is partially aligned with the current literature and the hypothesis. Most studies examining the association between ACEs and SI report that the majority, if not all, subcategories of ACEs predict later suicidality (Wang et al., 2019). While there is conflicting evidence regarding the consistent prediction of suicidality by household challenges, such as parental separation or incarceration of a family member (Sahle et al., 2022), a more robust body of research consistently associates emotional, physical, and sexual abuse, as well as emotional and physical neglect during childhood with later STBs (Miller et al., 2013; Pournaghash-Tehrano et al., 2021; Wang et al., 2022).

Given this evidence, it is worth noting that only three out of 10 subcategories of ACEs were significantly associated with SI severity in the current study. The nonsignificant results across seven subcategories of ACEs should be interpreted with caution, as significant outcomes were identified solely within the three most prevalent categories of ACEs in the sample, with parental separation being the only exception (i.e., parental separation was prevalent, but the interaction was not significant; Table 2). Hence, the lack of significant results in the remaining seven ACE categories associated with SI severity may be due to insufficient representation of adolescents who experienced those specific adversities in the sample. Moreover, subcategories of ACEs that are consistently associated with SI severity, such as physical and sexual abuse, exhibited potential significance. While

not significant at $p = .05$, both physical abuse ($\beta = 0.37$, $p = .08$; Table 2) and sexual abuse ($\beta = 0.40$, $p = .09$) were significant at $p = .10$. The detection of some significance despite the small sample size may suggest a moderate association between the adolescent SI severity and specific ACE types.

Contrary to the hypothesis, the result did not suggest that adolescents with at least one ACE endorse a higher severity of SI than those without ACEs. This finding is not aligned with the existing literature and should be interpreted with caution for several reasons. Scoring one on the ACE-Q may not definitively indicate the presence of adverse events in childhood. For instance, question six on the ACE-Q evaluates parental separation or divorce, which is generally associated with various negative mental health outcomes in children (Çaksen, 2022). However, the impact of divorce depends on factors such as the intensity and duration of the separation process, as well as the availability of familial or non-familial support (Spremo, 2020). Since the ACE-Q lacks detailed assessments of these nuanced aspects, it is difficult to determine whether an affirmative response to question six or other questions signifies an adverse event experienced in childhood.

Moreover, Spremo (2020) suggests that family dynamics typically stabilize two to four years after divorce. Without knowing the timing of parental divorce relative to the date of assessment, we lack the temporal context to accurately gauge how the presence of at least one ACE, especially parental separation, predicts adolescent SI. Lastly, it is plausible that the negative impact of ACEs may not fully manifest itself when assessed in close proximity to the occurrence of the adverse event. However, this explanation appears less likely as a large body of research suggests that ACEs are generally associated with an increased risk of SI and suicide attempts across community, clinical, and high-risk samples of adolescents (Miller et al. 2013).

Once again, contrary to the hypothesis, no significant association was observed between the count of ACEs and the severity of SI. This finding should also be interpreted with caution, considering a body of research that suggests an alternative perspective. For instance, a study with a sample of 989 Chinese college students concluded that a cumulative effect was observed between ACEs and SI, indicating that a higher count of ACEs corresponded to an increased likelihood of endorsing SI (Wang et al., 2019). While Chinese society has increasingly integrated elements of individualism through Western influence, it remains more collectivistic than the U.S., particularly in its emphasis on family interdependence (Kolstad & Gjesvik, 2014).

Cultural factors like these may influence how individuals perceive and respond to adversity within the family context (Oyserman & Lee, 2008). However, cultural explanations alone appear insufficient to account for the discrepancy between the current findings and those from studies conducted in collectivistic contexts. Notably, similar associations between the cumulative negative impact of ACEs on SI have been observed in a sample of 1,532 U.S.-based adolescents (Meeker et al., 2021). It is possible that the absence of a significant association in the current study is attributable, at least in part, to the limited sample size.

Limitations and Future Directions

There are several limitations to consider in interpreting the findings. Although the current sample was ethnically diverse, the small sample size may impact the generalizability of the findings. Several negative findings did not align with the existing literature (i.e., nonsignificant association between the presence of one ACE, counts of ACEs, and selected forms of ACEs with SI severity). The analyses should be replicated in a larger sample for more precise and representative findings.   .

Furthermore, although not statistically significant, the recurring pattern of negative association between counts of ACEs and severity of SI in high FF warrants future investigation in a larger sample. If replicating this analysis in a larger sample reveals a statistically significant decrease in SI for adolescents from families with high FF, it would suggest that not only are the negative effects of ACEs on adolescent suicidality potentially more pronounced in those with lower FF, but also that higher FF could serve as a protective factor. Lastly, FF and PPC should be evaluated as composite moderators in a larger sample, as the current study may have lacked the statistical power in the analysis to detect a significant interaction effect.

Additionally, the study did not include measures of psychiatric disorders (e.g., major depressive disorder, generalized anxiety disorder, or posttraumatic stress disorder), which are known to be closely associated with both ACE exposure (Daníelsdóttir et al., 2024) and SI (Gilmour, 2016; Panagioti et al., 2015; Rihmer & Rihmer, 2019). Due to limitations in available data, key demographic variables such as household income, single-parent status, and parental education level were not included in the analyses either. The absence of these variables limits the ability to assess potential confounding effects or to better contextualize the observed association.

The cross-sectional design of the study also limits our ability to explore the dynamic changes in adolescent experiences with ACEs over time. Future research could benefit from longitudinal investigations which capture the evolving impact of ACEs throughout adolescents' lives. Additionally, the use of self-report measures intro-

duces potential biases. Recall bias, along with individual differences in how adolescents define events as adverse, may impact the accuracy of reported ACEs. Relatedly, FF and PPC assessments may have been influenced by transient factors such as recent adolescent-parent conflicts (e.g., arguing with parents right before the assessments).

The utilization of the Ecological Momentary Assessment (EMA) has the potential to address both concerns. With the use of appropriate questions, the EMA methodology may enable the capture of real-time fluctuations in family interactions. This includes assessing the frequency, intensity, and content of parental criticism, as well as adolescents' corresponding STBs. Finally, despite both variables being mean-centered to improve the interpretability of the regression model, the multicollinearity between ACEs and FF should be noted in interpreting results.

Clinical Implications

Given that FF and PPC are found to independently amplify and attenuate the effects of ACEs in adolescent suicidality, strategies focused on enhancing FF while simultaneously mitigating PPC should be considered. Clinically, targeted interventions can be developed to achieve the desired goal. When treating youth with suicidal thoughts, clinicians can assess for ACEs, FF, and PPC to identify at-risk individuals and provide appropriate early prevention support within the family context (e.g., implementing targeted family therapy, providing specific parenting support, or designing programs that address FF and PPC). Evidence-based treatment targeting family cohesion can also be employed (e.g., Attachment-Based Family Therapy; ABFT; Diamond et al., 2010; Diamond et al., 2003).

Fostering an environment that promotes open communication and supportive family relationships becomes crucial at home. Encouraging positive interactions, active listening, and constructive dialogue can enhance FF and mitigate potential PPC issues. Implementing structured family activities such as shared meals may further strengthen familial bonds (Utter et al., 2013). Additionally, educational initiatives can be extended to parents and caregivers to raise awareness about the impact of ACEs and the role of FF and PPC in adolescent mental health.

Providing resources and guidance on effective parenting strategies and communication skills can empower families to create a nurturing and resilient environment. While it is ideal for parents or guardians to be involved in treating adolescents for their STBs, there are situations in which this is not feasible (e.g., intense family conflict, abuse, neglect, or when caregivers are unavailable or unwilling to participate). Cultural stigma or differing beliefs about mental health treatment may also limit caregiver involvement. In such cases, treatment can focus on building adolescents' skills (e.g., emotion regulation, distress tolerance) to help them manage their well-being independently. This approach may still be effective, as both FF and PPC reflect not only the objective reality of familial dynamics but also adolescents' subjective perceptions of them.

Conclusion

The present study found that family functioning (FF) and perceived parental criticism (PPC) independently moderated the relationship between adverse childhood experiences (ACEs) and suicidal ideation (SI) in an ethnically diverse adolescent sample. This novel contribution to the literature highlights how specific family dynamics may either buffer or exacerbate the impact of early adversity on youth suicidal thoughts. Several unexpected null findings also emerged: (1) only certain forms of ACEs were significantly associated with adolescent SI; (2) the presence of at least one ACE and the total number of ACEs were not significantly associated with SI; and (3) the moderation model was nonsignificant when FF and PPC were assessed as a composite variable. These findings should be interpreted with caution, particularly considering the study's limitations, as they diverge from previous research. To gain a more nuanced understanding of the critical role of family in adolescent development in the context of ACEs and suicidality, future studies should replicate this research in a larger sample and collect more detailed information on adolescents' perceptions and reports of ACEs, FF, and PPC.

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Table 1

Demographic Characteristics of the Participants

Sample Characteristics	*M (SD)*	Min	Max	*n*	%
Age (years)	17.43 (1.36)	15	19		
Sex					
Male				12	26.09
Female				32	69.57
Transgender Male				1	2.17
Other				1	2.17
Race					
White				21	45.65
Black				11	23.91
Asian				10	21.74
Other				2	4.35
Unknown				2	4.35
Ethnicity (% Hispanic)				8	17.39
Sexual Orientation					
Heterosexual				31	67.39
Homosexual				4	8.70
Bisexual				9	19.57
Questioning				1	2.17
Other				1	2.17

Note. N = 46

Table 2

Linear Regression Analyses: Severity of Suicidal Ideation (SI) and Subcategories of Adverse Childhood Experiences (ACEs)

Variable	*n*	*β*	*SE*	*LL*	*UL*	t	*p*
Emotional Abuse	11	0.49	3.98	2.44	18.90	2.44	**.01***
Physical Abuse	8	0.37	4.15	-1.11	16.15	1.81	.08
Sexual Abuse	4	0.40	5.11	-1.52	20.05	1.81	.09
Emotional Neglect	12	0.65	5.04	10.88	31.66	4.22	**<.001***
Physical Neglect	2	0.22	5.49	-6.93	16.47	0.87	.40
Parental Separation	16	-0.02	2.88	-5.93	5.89	-0.01	>.99
Witnessing Domestic Violence	6	0.29	4.44	-3.37	15.24	1.34	.20
Household Substance Abuse	3	-0.21	3.96	-11.80	5.00	-.86	.40
Household Mental Illness and SA	13	0.39	5.43	0.42	22.79	2.14	**.04***
Incarceration of Family Member	4	0.39	4.52	-1.78	17.31	1.72	.10

Note. SE = Standard Error; LL = Lower Limit; UL = Upper Limit; SA = Suicide Attempts.
*p < .05

Table 3

Summary of Moderated Regression Analyses Predicting Suicidal Ideation (SI) Severity in Adolescents

Variable	Estimate (β)	SE	LL	UL	t	p
Hypothesis 2a (Model 1)[a]						
Constant		1.23	2.02	7.14	3.74	**<.01***
ACEs	0.21	0.68	0.07	2.90	2.19	**.04***
FF	0.19	2.74	-1.25	10.19	1.63	.12
ACEs x FF	0.28	1.06	1.53	5.95	3.53	**<.01***
Hypothesis 2b (Model 1)[b]						
Constant		1.49	3.99	10.15	4.76	**<.001***
ACEs	0.48	0.85	1.68	5.19	4.06	**<.001***
PPC	0.29	0.36	0.18	1.69	2.58	**.02***
ACEs x PPC	0.19	0.15	0.18	0.63	2.20	**.04***
Hypothesis 2c (Model 3)[c]						
Constant		1.83	-0.07	7.70	2.08	.05
ACEs	0.18	1.42	-1.71	4.29	0.91	.38
PPC	0.12	0.39	-0.40	1.26	1.09	.29
FF	0.17	3.71	-4.00	11.72	1.04	.31
ACEs x PPC	-0.11	0.22	-0.66	0.29	-0.84	.41
ACEs x FF	0.32	1.57	0.89	7.56	2.69	**.02***
PPC x FF	0.06	0.78	-1.27	2.01	0.48	.64
ACEs x PPC x FF	-0.03	0.26	-0.63	0.46	-0.33	.74

Note. ACEs = Adverse Childhood Experiences; FF = Family Functioning; PPC = Perceived Parental Criticism; SE = Standard Error; LL = Lower Limit; UL = Upper Limit.
[a]ACEs will be more strongly associated with SI among adolescents who have lower family functioning; $n = 24$, $R^2 = .68$.
[b]ACEs will be more strongly associated with SI among adolescents who have higher perceived parental criticism; $n = 26$, $R^2 = .47$.
[c]ACEs will be more strongly associated with SI among adolescents who have higher perceived parental criticism and lower family functioning; $n = 24$, $R^2 = .72$.
*$p < .05$

Table 4

Conditional Effects of Adverse Childhood Experiences (ACEs) at Values of Family Functioning (FF)

FF[a]	Effect (β)	SE	*LL*	*UL*	*t*	*p*
-1 *SD*	-0.08	0.79	-2.24	1.06	-0.75	.46
Mean	0.20	0.68	0.07	2.90	2.19	**.04***
+1 *SD*	0.49	0.99	1.49	5.63	3.58	**<.01***

Note. SD = Standard Deviation; SE = Standard Error; LL = Lower Limit; UL = Upper Limit; FAD-GF = The McMaster Family Assessment Device – General Functioning.
[a]Higher score in FAD-GF indicates worse FF. This table based on the results of FAD-GF.
*$p < .05$

Table 5

Conditional Effects of Adverse Childhood Experiences (ACEs) at Values of Perceived Parental Criticism (PPC)

PPC	Effect (β)	SE	*LL*	*UL*	*t*	*p*
-1 *SD*	0.28	0.74	0.60	3.57	2.74	**.01***
Mean	0.47	0.85	1.68	5.19	4.06	**<.001***
+1 *SD*	0.67	1.30	2.14	7.54	3.71	**<.01***

Note. SD = Standard Deviation; SE = Standard Error; LL = Lower Limit; UL = Upper Limit.
*p < .05

Table 6

Conditional Effects of Adverse Childhood Experiences (ACEs) at Values of Family Functioning (FF) and Perceived Parental Criticism (PPC)

PPC	FF	Effect	SE	*LL*	*UL*	*t*	*p*
-1 *SD*	-1 *SD*	-0.06	1.24	-3.09	2.19	-0.36	.72
-1 *SD*	Mean	0.29	1.01	-0.04	4.23	2.08	.05
-1 *SD*	+1 *SD*	0.64	1.59	1.26	8.02	2.91	**.01***
Mean	-1 *SD*	-0.15	1.99	-5.27	3.17	-0.53	.60
Mean	Mean	0.18	1.42	-1.71	4.29	0.91	.38
Mean	+1 *SD*	0.50	1.25	0.98	6.29	2.90	**.01***
+1 *SD*	-1 *SD*	-0.23	2.94	-7.88	4.58	-0.56	.58
+1 *SD*	Mean	0.07	2.19	-4.16	5.14	0.22	.83
+1 *SD*	+1 *SD*	0.37	1.85	-1.29	6.56	1.42	.17

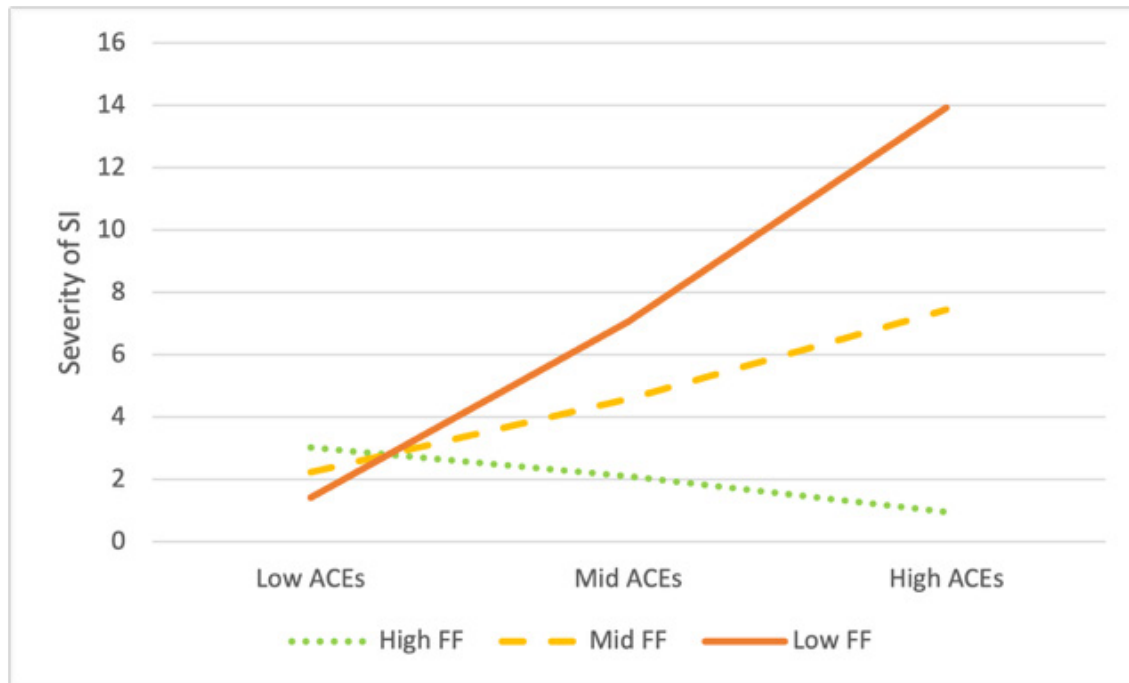*Note.* SD = Standard Deviation; SE = Standard Error; LL = Lower Limit; UL = Upper Limit.
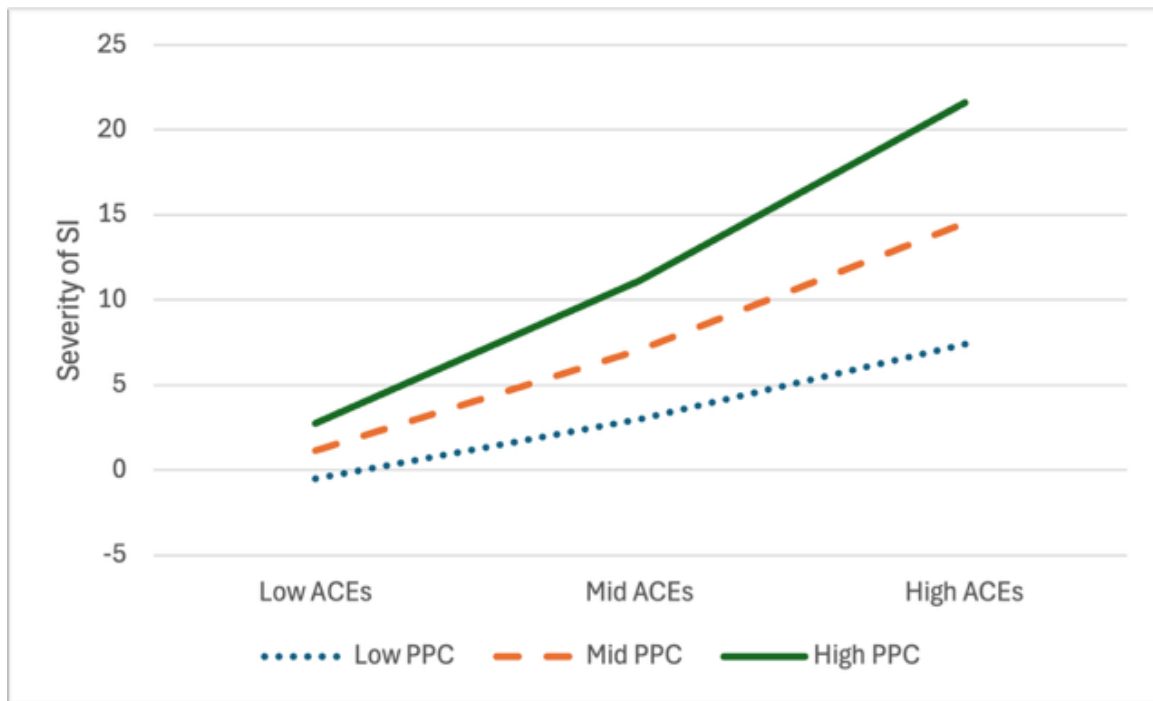*$p < .05$

Figure 1

Moderating Effects of Family Functioning (FF) on the Association Between Adverse Childhood Experiences (ACEs) and Adolescent Suicidal Ideation (SI)

Note: The interactions between variables are statistically significant ($p < .05$) for Low FF and Mid FF. However, the downward trend observed in High FF was not significant. Additional details are available in Table 4.

Figure 2

Moderating Effects of Perceived Parental Criticism (PPC) on the Association Between Adverse Childhood Experiences (ACEs) and Adolescent Suicidal Ideation (SI)
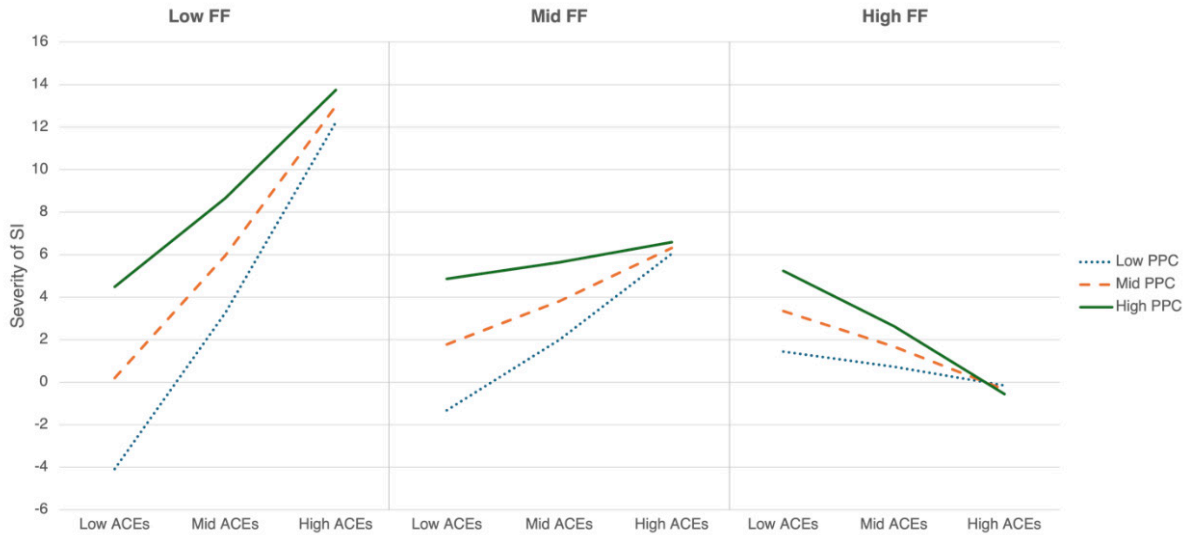

Note: The interactions between variables are statistically significant ($p < .05$) for all categories of PPC. Additional details are available in Table 5.

Figure 3

Moderating Effects of Family Functioning (FF) on the Association Between Adverse Childhood Experiences (ACEs) and Adolescent Suicidal Ideation (SI)

Note: Among the nine slopes depicted in the figure, only Low PPC x Low FF and Moderate PPC x Low FF were statistically significant at $p < .05$. Additional details are available in Table 6.