Master's thesis

Adverse Interpersonal Experiences and Identity: The Role of Dissociation and Problem-focused Coping

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Are there deviations of the Master's thesis from the proposed plan?
☐No
☒Yes, please explain below the deviations

Hypothesis 1 has been reordered to be hypothesis 2. Hypothesis 2 was reordered to be hypothesis 1 and focuses on lack of identity instead of disturbed identity and lack of identity. Hypothesis 3 is now part of hypothesis 1a and 1b. A new hypothesis 3 was added to explore the change in impact of adverse interpersonal experiences. The proposed model has been simplified and redesigned. The sample size for the original study given in the research plan was 180. Additional participants were recruited, leading to a sample size of 194 completers for the original study. Post-hoc analyses were included in the analyses.

Abstract

Objective

This study investigated the association between adverse interpersonal experiences (AIE) and lack of identity, and the mediating roles of dissociation and problem-focused coping.

Methods

Undergraduate students were examined through self-report surveys, focusing on (childhood) AIE as a predictor of identity. The impact of trait dissociation and identity disturbances on change in impact of AIE was also explored.

Results

Dissociation or problem-focused coping did not mediate between AIE and lack of identity. However, dissociation correlated positively with lack of identity irrespective of the experience type. Problem-focused coping displayed a negative correlation. Childhood AIE did not predict lack of identity. Neither trait dissociation nor identity disturbances predicted the change in AIE impact significantly.

Conclusion

These results suggest that dissociation and lack of identity go together, while people who use problem-focused coping strategies are less likely to experience lack of identity. Caution is warranted due to the small sample size.

Keywords: Interpersonal trauma, trait dissociation, coping strategies, identity

Adverse Interpersonal Experiences and Identity: The Role of Dissociation and Problem-focused Coping

Dissociative symptoms are defined as a cluster of experiential disruptions in the integration of identity and reality. Dissociation is characterized by a discontinuity of experience or a disconnect between memory, identity, perception, motor control, emotions, and body representations (American Psychiatric Association, 2013). Dissociation occurs in mild forms, such as absorption and daydreaming (Aksen et al., 2021), but also in pathological forms, such as depersonalization (e.g., experiencing detachment from oneself), derealization (e.g., experiences of unreality), dissociative amnesia (forgetting important autobiographical memories), and in severe cases a fragmented identity (e.g., Dissociative Identity Disorder (DID)). Dissociative symptoms are a hallmark of dissociative disorders but also occur in other disorders, such as post-traumatic stress disorder (PTSD) and psychotic disorders (Chiu et al., 2016). There is growing attention to the link between dissociation and childhood physical and sexual abuse and neglect in clinical populations (Renard et al., 2017; Vonderlin et al., 2018). Lynn et al. (2022) proposed a transdiagnostic model in which dissociation is described as a failure of adaptive functions, such as metacognition, affective and cognitive self-regulation, and response sets in reaction to stressful experiences. Adverse interpersonal experiences (AIE) can act as stressors that trigger the failure of adaptive functions, particularly in vulnerable individuals like children. The failure of adaptive functions disturbs the integration of internal identity and external reality, and in severe cases the resulting dissociative response set may be misinterpreted as another identity or an external voice (Lynn et al., 2019; McEnteggart et al., 2017). Previous research associated severe AIE such as sexual abuse with identity disturbances in people (Frewen et al., 2020; Lanius et al., 2020; Oshri et al., 2017; Slaninova & Stainerova, 2015; Truskauskaite-Kuneviciene et al., 2020). However, few studies investigated the role of dissociation in the relationship between AIE and identity disturbances. Dissociation is often described as a maladaptive coping mechanism that psychologically removes oneself from a stressor in overwhelming situations where other forms of coping or escape are not adaptive or available (Gómez, 2020; Lynn et al., 2022; Vonderlin et al., 2018). Although dissociation may reduce anxiety short-term, dissociation is associated with negative long-term effects due to insufficient integration of the distressing experience into memory and identity (Paetzold & Rholes, 2021). This is assumed to lead to identity disturbances (Lassri et al., 2023). However, it is unclear whether identity disturbances are manifestations of severe dissociation (e.g., DID), or whether they can be

understood as an aspect of trait dissociation detectable in non-clinical samples exposed to AIE.

Identity Disturbances

The self-concept describes the psychological structures which people use to make sense of themselves and the world (Oyserman et al., 2012). The self-concept provides people with a continuous sense of *me-ness* of experience. Identities are defined as nested components through which people make sense of the self-concept (e.g., social identities, religious identities) (Oyserman et al., 2012). The self-concept can thus be defined as the whole into which various identities that develop in one's lifetime are integrated. Identities serve an important function by making sense of experiences and integrating them with the self-concept. Identity development starts in early childhood and usually stabilizes in early adulthood (Kaufman et al., 2015). The Self Concept and Identity Measure (SCIM) (Kaufman et al., 2015) operationalizes identity-development via three dimensions: *Consolidated identity* refers to the optimal outcome of identity development with a clear and unified self-concept. In contrast, *disturbed identity* describes suboptimal identity development, such as extreme fluctuations or being overly dependent on other people (Bogaerts et al., 2021). *Lack of identity* refers to identity disturbances where people describe themselves as broken, lost, or incomplete (Bogaerts et al., 2021). Identity development can be disrupted when people cannot make sense of impactful experiences and fail to integrate them into a unified self-concept (Kaufman et al., 2015). In contrast to ordinary experiences (e.g., reading) which can be integrated into the self-concept through an identity (e.g., "I am a book-lover"), traumatizing experiences can lead to difficulties to form a coherent identity that integrates the experience into the self-concept. Research suggests that this is so because heightened emotional arousal during adverse experiences prevents the integration of the experience with its context (Huntjens et al., 2015) and disrupts the sense of continuity of the self that is usually provided by autobiographical memory (Lampinen et al., 2004). It follows then that disruptive adverse experiences are poorly integrated with emotional information and self-representations in long-term memory (Chiu et al., 2017; Roberts & Reuber, 2014). To illustrate, a child who is sexually abused by a parent may not be able to form an identity that makes sense of the experience and therefore struggles to integrate the experience into the self-concept. When the integration of identity and experiences fails, it can result in dissociation (cf. Nijenhuis & van der Hart, 2011). Dissociation during an adverse event can contribute to a disintegrated autobiographical memory and a less cohesive identity, altering one's experience of self and the world. This is evident in individuals with PTSD, who

commonly report negative core beliefs, low self-esteem, identity disturbances, and derealization (Lanius et al., 2020). Identity disturbances may be particularly common after adverse *interpersonal* experiences.

Adverse Interpersonal Experiences

Research often associates AIE such as sexual or physical abuse and neglect with identity disturbances and dissociation. Adverse experiences with an interpersonal character can have particularly detrimental psychological effects compared to incidental adverse events like natural disasters or accidents, as evidenced by the behaviors commonly observed in individuals who have experienced interpersonal trauma, such as avoidance and dissociation (Nijenhuis & van der Hart, 2011). This is supported by a meta-analysis by Vonderlin et al. (2018) who reported a strong association between recurrent early-onset childhood interpersonal abuse (i.e., before age 12-13) and the development of later impairments, such as dissociative symptoms. Vonderlin et al. (2018) suggest that dissociation is a learned stress-response which leads to more dissociative experiences in the future and thereby changes development. People who were abused by someone familiar (e.g., parent) may be particularly prone to dissociative experiences because dissociation provides a psychological escape from the abuse while maintaining the dependent relationship with the caregiver (cf. trauma betrayal; Gómez, 2020). Individuals who have endured interpersonal sexual or physical abuse may be particularly vulnerable to dissociation and identity disturbances.

Dissociation as a Mediator Between Adverse Experiences and Identity Disturbances

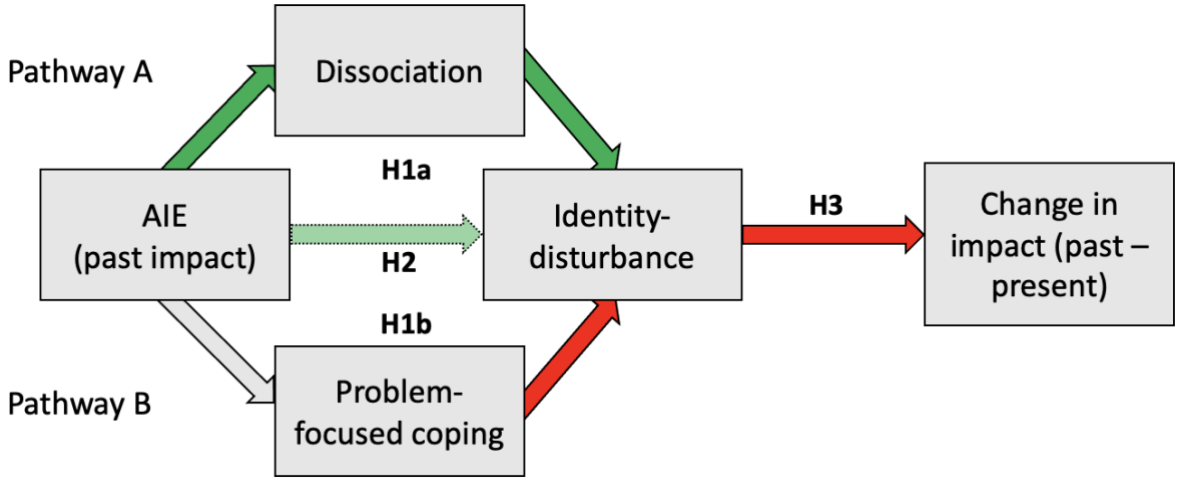
Identity disturbances may be an attribute of dissociation rather than being a direct consequence of AIE. Dissociation disrupts the integration of self and reality (Lynn et al., 2022; Vonderlin et al., 2018), and research by Chiu et al. (2017) suggests that people prone to dissociation have a more fragile sense of identity. A fragile identity can impede the integration of experiences and the self (Oyserman et al., 2012). This can become a feedback loop, as research suggests that people with a less cohesive identity are more likely to experience dissociation (Paetzold & Rholes, 2021). Over time, dissociation may become a response set to deal with distressing situations or memories. However, as dissociation impedes the integration of memories of AIE into one's self-concept (Paetzold & Rholes, 2021), this may sustain identity disturbances and the long-term impact of AIE. Consequently, people may develop a disturbed identity or lack of identity if they dissociated in response to an AIE. This suggests that dissociation mediates between AIE and identity disturbances.

A Two-Pathway Model

The impact that adverse experiences have on identity is highly individual and depends on factors, such as the type and number of adverse experiences, and the coping strategies that people use to deal with such experiences (Overbeek et al., 2022). Coping strategies are commonly categorized into approach-oriented and avoidance-focused coping (Overbeek et al., 2022). An example of approach-oriented coping strategies are problem-focused coping strategies such as seeking social support. Problem-focused coping can buffer the negative impact of adverse experiences (Munroe et al., 2022). Avoidance-focused coping is associated with an inability to make sense of adverse experiences (Brooks et al., 2019). Dissociation can be conceptualized as an extreme form of avoidance-focused coping (Briere et al., 2010). These contrasting findings in the literature suggest that the association between coping-strategies and identity disturbances can be twofold. The current study therefore proposes a two-pathway model with two contrasting hypotheses in which dissociative coping and problem-focused coping are associated with different outcomes regarding identity. Coping strategies are proposed to mediate between AIE and identity so that people who employ dissociation as a coping strategy in reaction to AIE may develop identity disturbances (Pathway 1 in Figure 1). In contrast to the first pathway, problem-focused coping-strategies may be an alternative mediator where the positive association between coping and identity disturbances does not hold. It is therefore proposed that problem-focused coping-strategies are negatively associated with identity disturbances (Pathways B in Figure 1).

Figure 1

Two-Pathway Model for the Impact of AIE and Identity Disturbances



Note. Green arrows represent assumed positive correlations. Red arrows represent expected negative correlations. Although the experience of AIE could be expected to be negatively associated with problem-focused coping, the arrow connecting AIE and problem-focused coping is grey to account for the possibility that AIE stimulated participants to engage in problem-focused coping.

Present Study

The current study investigated whether trait dissociation or problem-focused coping mediates the relationship between AIE and lack of identity in a non-clinical undergraduate student sample. Secondary aims were to explore childhood AIE as a predictor of lack of identity, and whether dissociation and identity disturbances maintain the impact of AIE. This study builds on data from a previous study, hereafter referred to as the "original study," in which 194 first-year psychology students completed a source monitoring task and questionnaires assessing trait dissociation and exposure to adverse (interpersonal) experiences. To complement earlier data collection, additional data were collected in an add-on study to investigate identity and coping strategies in a subsample of participants.

Research Questions and Hypotheses

The central research questions and hypotheses are:

1) Is there a positive association between the past impact of AIE and lack of identity, and is this relationship mediated by trait dissociation?

H1a: It is hypothesized that there is a positive association between the past impact of AIE and lack of identity, and this relationship is mediated by dissociation.

H1b: In this alternative hypothesis, it is hypothesized that there is a negative association between the past impact of AIE and lack of identity, and this association is mediated by problem-focused coping.

2) Do childhood AIE predict lack of identity?

H2: Childhood AIE are expected to predict greater lack of identity when controlling for the sum of past impact of AIE.

3) Are trait dissociation and identity disturbances negatively associated with the change between past and present impact of AIE?

H3: Trait dissociation, lack of identity, and disturbed identity are expected to be negatively associated with the change between past and present impact of AIE when controlling for the past impact of AIE and years since the latest AIE.

Method

Design

The current study combined data from the original study about dissociation and source monitoring with an add-on study about identity and coping styles. Participants were blind to the purpose of the first study but were aware of the purpose of the add-on study.

Population

The population of interest are undergraduate students.

Participants

231 first-year psychology-students were recruited for the original study on source monitoring and dissociation, of which 194 completed the study. A sub-sample of 94 participants was recruited for the add-on study in which identity and coping styles were assessed. An a priori power analysis in G*Power suggested that 68 participants are required to maintain power of 0.8 when detecting a small effect size (0.15) for a regression analysis with mediation with two predictors (hypotheses 1a and 1b). For three predictors (hypothesis 2) the estimated sample size was 77, and 92 for five predictors (hypothesis 3).

Materials

Self-Concept and Identity Measure (SCIM)

Participant's identity functioning was assessed with the SCIM (Kaufman et al., 2015). The SCIM contains 27 items. Participants rated each item on a 7-point Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *neither agree nor disagree*, 5 = *somewhat agree*, 6 = *agree*, 7 = *strongly agree*). A sum score and average were calculated for each of the three domains. The consolidated identity domain includes items 1, 2, 3, 5, 9, 11,

14, 16, 17, and 19 (e.g., "*I know who I am*"). The disturbed identity domain includes items 4, 6, 7, 10, 12, 18, 21, 23, 25, 26, and 27 (e.g., "*I imitate other people instead of being myself")*. The lack of identity domain includes items 8, 13, 15, 20, 22, and 24 (e.g., *"I feel lost when I think about who I am*"). Lack of identity served as the dependent variable when testing hypotheses 1a, 1b, and 2. The SCIM has been validated in multiple clinical and non-clinical American and Belgian samples (Bogaerts et al., 2018; Bogaerts et al., 2021; Kaufman et al., 2019). The SCIM had adequate to high internal consistency reliability in the current sample (Appendix C).

Coping Orientation to Problems Experienced Inventory (Brief-COPE)

The Coping Orientation to Problems Experienced Inventory (Brief-COPE) (Carver et al., 1989) is a 28-item questionnaire which assesses coping styles on a 4-point Likert scale (1 = *I haven't been doing this at all*, 2 = *a little bit*, 3 = *a medium amount*, 4 = *I've been doing this a lot*). In line with the method by Dias et al. (2012), items 2, 7, 10, 12, 14, 17, 23, and 25 were categorized as problem-focused coping strategies (e.g., "*I've been getting help and advice from other people*"), items 5, 9, 13, 15, 18, 20, 21, 22, 24, 26, 27, 28 as emotion-focused strategies (e.g., "*I've been making jokes about it*"), and items 1, 3, 4, 6, 8, 11, 16, 19 as avoidance-focused coping strategies (e.g., "*I've been using alcohol or other drugs to help me get through it*"). Problem-focused coping includes strategies focusing on approaching and changing the stressor, such as seeking social or instrumental support, planning, and positive reframing (Dias et al., 2012). Emotion-focused strategies, such as self-blame, acceptance, or religious coping aim to regulate emotions related to the stressor (Dias et al., 2012). Avoidance-focused strategies are characterized by disengagement from the stressor through denial, substance use, distraction, or behavioral avoidance (Dias et al., 2012). A factor analysis by Dias et al. (2012) confirmed the structure of the three proposed categories. The Brief-COPE has adequate internal validity and reliability (Carver, 1997). In the current sample, internal consistency reliability ranged from acceptable to good, with more heterogenous constructs in the emotion-focused and avoidance-focused items (Appendix C).

Curious Experiences Survey (CES)

Trait dissociation was assessed with the Curious Experiences Survey (CES) (Goldberg, 1999) – a 31-item questionnaire asking about dissociative experiences (e.g., "*had the experience of feeling that other people, objects, and the world around me were not real*"). Items were rated on a 5-point Likert scale (1= *this never happens to me*, 2 = *this occasionally happens to me*, 3 = *this sometimes happens to me*, 4 = *this frequently happens to me*, 5 = *this is almost always happening to me*). The CES was validated in a sample of 194 undergraduate

students and has good reliability and internal consistency (Cann & Aitken Harris, 2003). Internal consistency reliability in the current sample was high (Appendix C).

Life Events Checklist for DSM-5 (LEC-5)

Presence of adverse experiences was assessed with the Life Events Checklist for DSM-5 (LEC-5) (Gray et al., 2004). The LEC-5 is a 17-item-checklist which screens for the exposure (yes, no) to a variety of adverse experiences (e.g., physical violence, sexual abuse). The LEC-5 asks participants whether they directly experienced the event or whether they witnessed the event. For the purpose of the current study, the LEC-5 was adapted to also enquire about the age at which the event occurred and the impact of adverse experiences in the past (i.e., when the experience occurred) and present. Participants rated the impact on a scale from 1-5 where 1 indicates *least impact*, 3 indicates *moderate impact*, and 5 indicates *most impact*. For the present study, only items that assess self-experienced AIE (items 6-9: physical assault, assault with a weapon, sexual assault, unwanted sexual experience) were included in the analyses. Sum scores were calculated for the included items to account for the possibility that a high-rated single event could have been as impactful as multiple less impactful events. Higher scores on the sum of past impact of AIE can thus represent higher impact and/or a greater number of events. For example, a participant reporting two events with a rated impact of 1 and 4 respectively, received a score of 5. A participant reporting one event with a past-rated impact of 5 also received a sum score of five. The present study considered an adverse event to have occurred in childhood if it happened before the age of 13. The threshold of 13 years was chosen as a cutoff for the vulnerable period for the development of dissociative symptoms proposed by Vonderlin et al. (2018). The LEC-5 has good convergent validity with trauma measures, its temporal stability is adequate, and the LEC-5 correlates with measures of PTSD in undergraduate students (Gray et al., 2004).

Procedure

The studies were approved by the ethics committee of the University of Groningen. Participants signed the informed consent form and completed the original study in the laboratory of the faculty of behavioral and social sciences at the University of Groningen in 2022. The original study included an experimental task about source-monitoring. After the task, participants filled in the CES (Goldberg, 1999) to assess trait dissociation and an adapted version of the LEC-5 (Gray et al., 2004) to assess participants' exposure to adverse (interpersonal) experiences. Participants completed the add-on study in 2023 through a *Qualtrics* online survey. This involved the completion of the SCIM (Kaufman et al., 2015), the Brief-COPE (Carver et al., 1989), and the Thought Suppression Inventory-Revised (TSI-

R) (van Schie et al., 2016). The TSI-R was not used in the present study. The last question of the *Qualtrics* survey asked participants whether they were responding truthfully.

Analyses

Data preparation including the calculation of variables was conducted in Microsoft Excel (Microsoft Corporation, 2023) and in RStudio Version 2023.03.0+386 (RStudio Team, 2023). All analyses were conducted in RStudio (see Appendix E for a list of included R-packages). Chat GPT was used to annotate and troubleshoot problems with the R-code (OpenAi, 2023). An alpha level of 0.05 was considered as statistically significant. Zero-order correlations and bivariate analyses (t-tests, Chi-square tests) were performed to examine relationships among variables and explore potential differences between participants with complete data and those with missing data. Effect sizes of correlations were interpreted using the operationalizations given by Cohen (1992). Mediation analyses were conducted with the *mediation* R package (Tingley et al., 2014). Assumptions of linear regression were checked with QQ plots, histograms, residual plots (residuals versus fitted, residuals versus leverage, standardized residuals versus fitted values), the Shapiro-Wilk test of normality, the Breusch-Pagan test of homoscedasticity, and examinations of the skewness and kurtosis of the distributions. Influential observations and outliers were detected with the R function *influence.measures*. An observation was considered influential if its Cook's distance was greater than 4/n (cf. Agresti, 2018). In case of violations of assumptions, the model was fitted with and without outliers. The Akaike Information Criterion (AIC) was used to compare the fit of models with and without outliers. Variables were tested for multicollinearity. Bonferroni corrections were applied for multiple testing. Post-hoc analyses were conducted to explore the data further. Cronbach's alpha and McDonald's Omega were calculated as measures of internal consistency (Appendix C).

Sum scores for past and present impact of LEC-5 AIE were calculated. In case participants reported multiple impact scores for a LEC-5 experience, the average of the two impact scores was used. For example, a participant reporting physical assault at age 12 and 18 and rated them with an impact of 2 and 3 respectively received a score of 2.5. The mean score was used because multiple participants reported multiple ages for LEC-5 AIE but gave only a single impact score. Assuming that participants averaged the impact of the events, it is reasonable to average the multiple impact scores instead of using sum scores for individual items and thereby inflating the overall impact sum score.

Multiple linear regression models were built with forward regression starting with theoretically important variables and predictors with the largest zero-order correlations with

the dependent variable. The model building process was stopped when the explained variance no longer increased, and all theoretically important predictors had been added. Mediation analyses were conducted through nonparametric bootstraps with 1000 simulations.

To test hypothesis 1a, a multiple linear regression with mediation analysis was conducted with the lack of identity subscale average of the SCIM as the dependent variable, trait dissociation – operationalized as the CES average – as the mediator, and the sum score of the past impact of AIE (LEC-5 items 6-9) as the predictor variable. The main effect (lack of identity ~ sum of past impact) was tested first, after which the mediation effect (trait dissociation ~ sum of past impact) was tested. The first predictor included in the model was the sum of past impact of AIE. Trait dissociation was added next. Years since the latest AIE was added as a covariate to control for the influence of time-effects. Years since the latest AIE was operationalized as the difference between the latest reported age when an AIE occurred and the current age of the participant. The equation for the model is:

$$SCIM_{Lack} = \beta_0 + \beta_1 PastImpact + \beta_2 CES + \beta_3 Years + \varepsilon$$

Hypothesis 1b was tested with a multiple linear regression analysis with the lack of identity subscale average of the SCIM as the dependent variable, the sum score of past impact of AIE as the predictor variable, and the average of the Brief-COPE problem-focused coping subscale as the mediator variable. Main effect and mediation effect models were tested first. Years since the latest AIE was added as a covariate to control for the influence of time-effects. The equation for the model is:

$$SCIM_{Lack} = \beta_0 + \beta_1 PastImpact + \beta_2 ProblemCoping + \beta_3 Years + \varepsilon$$

To test hypothesis two, a multiple linear regression analysis was conducted with childhood AIE (operationalized as self-reported LEC-5 items 6-9 before the age of 13) as the categorical predictor variable (coded: 1 = before age 13, 0 = after age 13) and the lack of identity subscale average of the SCIM as the dependent variable. The past impact of AIE and years since the latest AIE were added as covariates. The equation for the model is:

$$SCIM_{Lack} = \beta_0 + \beta_1 Childhood + \beta_2 PastImpact + \beta_3 Years + \varepsilon$$

To test hypothesis three, a multiple linear regression analysis was conducted with the difference between past and present impact of AIE as the dependent variable and trait dissociation (CES average), the lack of identity and the disturbed identity subscale-averages of the SCIM as the predictor variables. The past impact of AIE and years since the latest AIE were added as covariates. The equation for this model is:

$$ImpactChange = \beta_0 + \beta_1 CES + \beta_2 SCIMLack + \beta_3 SCIMDisturbed + \beta_4 PastImpact + \beta_5 Years + \varepsilon$$

Missing Data

Participants who did not fill out one or more of the instruments were omitted from the analyses by list-wise deletion. In case of missing data on the LEC-5, participants were not excluded from the analyses since participants were not expected to have experienced every event. Non-responses for LEC-5 experiences and responses with missing impact scores were treated as non-occurrences. Participants who did not report the age at which an AIE occurred were excluded from the analysis for hypothesis 2. Participants who did not provide the age for a witnessed experience or a non-interpersonal adverse experience were not excluded since the purpose of the present study was to investigate AIE that participants have experienced themselves. Missing items on the Brief-COPE were imputed with the mean of the subscale to which the item belongs. Participants who reported non-truthful answers were excluded from the analyses.

Results

Complications

Missing Data and Data Processing

Out of the 231 participants recruited for the original study, 94 completed the add-on study. Three participants were excluded because they reported that their answers were not truthful at the end of the *Qualtrics* survey, and four were excluded because they did not complete the original study. The final sample size was 87. Out of 87 participants included in the descriptive statistics, 55 participants reported AIE. Two participants were excluded from the analysis for the second hypothesis because they did not provide the age at which an LEC-5 AIE occurred. The final sample size was therefore 55 for hypotheses 1a, 1b, and 3, and 53 for hypothesis 2. See Appendix D for a log about data processing, complications, and the handling of missing data.

Comparison of participants with missing values for any of the LEC-5 age items and participants without missing age values with Welch's two sample t-tests and Chi-square tests revealed no statistically significant differences in terms of outcome variables, predictor variables, age, or gender. It is assumed that the missingness is unrelated to participant's identity development or the difference between past and present impact. However, it is possible that some missing values may be related to other variables. For instance, participants may remember that an event was impactful, but may not be remember how old they were

when the event occurred. It is therefore assumed that the missing values are missing at random.

One participant reported individual impact scores for multiple ages for the same LEC-5 event. The scores were averaged for the statistical analyses. Two participants had missing values on the Brief-COPE. The missing values were imputed with the mean of the corresponding Brief-COPE subscale mean. There were no statistically significant differences between participants with missing values on the Brief-COPE and participants with complete data.

Analysis

Descriptive Statistics

Age and gender of participants are shown in Table 1. Bivariate analyses showed that Males were on average older (M = 21.08 years, SD = 2.37) than females (M = 19.42 years, SD = 1.46) and this difference was statistically significant (p = .002). Women reported a greater average (M = 2.75, SD = 1.19) lack of identity score than men (M = 2.07, SD = 0.62), and this difference was statistically significant (p < .001). Fifty-five participants reported an AIE, and 22 participants reported childhood AIE. The age distribution of the youngest and oldest age at which an AIE occurred are shown in Figure 2. The mean age for the earliest occurrence was 13 years (SD = 4.64, range 3-21 years), and the mean for the latest AIE was 16.3 years (SD = 4.07, range 7-22 years).

Means and standard deviations of predictor and outcome variables are shown in Table 2. Frequencies and mean past-rated and present-rated impact of self-experienced and witnessed LEC-5 adverse life events are shown in Table 3. Zero-order correlations are shown in Figure A-1. Table 4 shows an overview of all four fitted regression models. Assumption checks for each regression model and information about skewness and kurtosis are shown in Appendix B.

Table 1

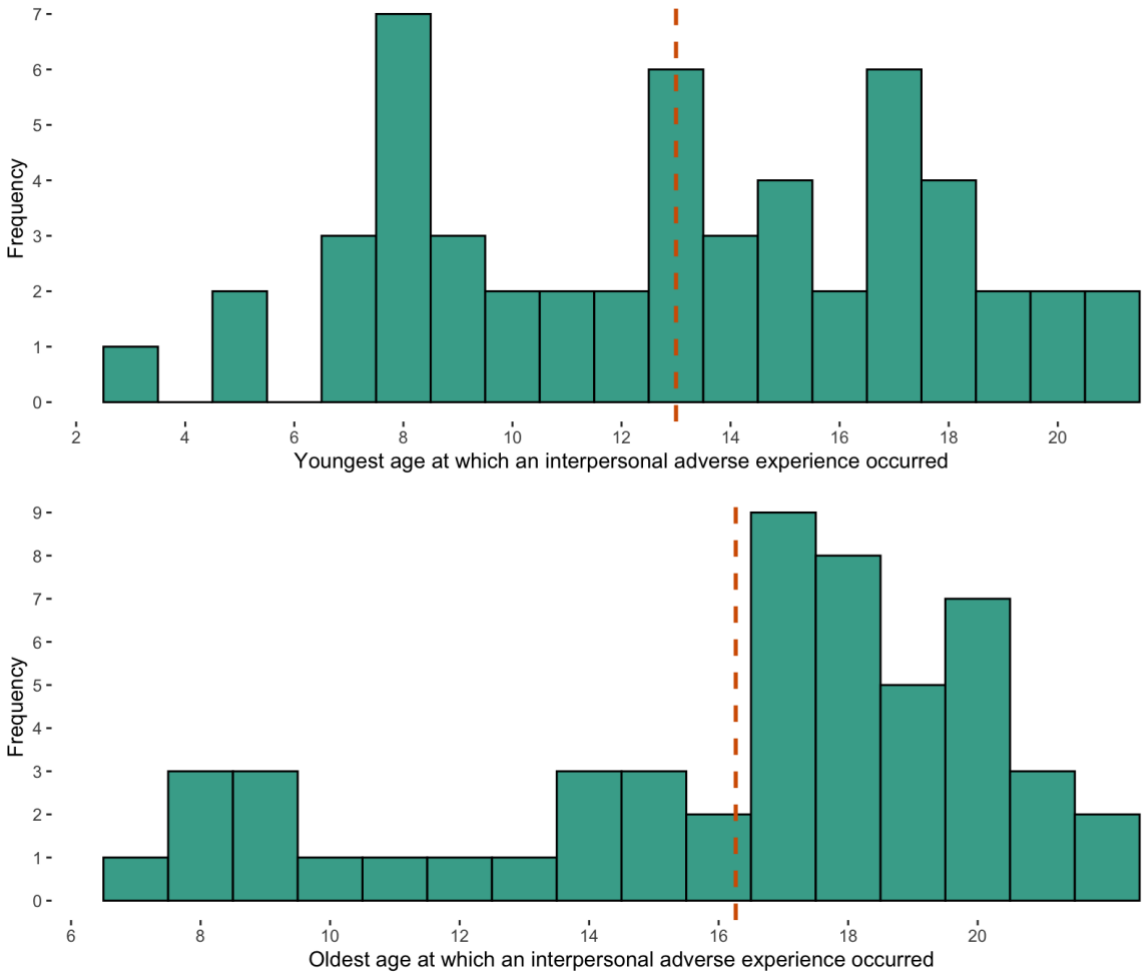
Age and Gender of Participants

Variable	Frequency (%)	Mean	Standard Deviation	*N*
Age	N/A	19.9	1.92	87
Gender Female	60 (69%)	N/A	N/A	87
Gender Male	26 (29.9%)	N/A	N/A	87
Gender Other	1 (1.1%)	N/A	N/A	87
AIE Females	41 (74.54%)	N/A	N/A	55
AIE Males	14 (25.45%)	N/A	N/A	55
Childhood AIE Females	15 (68.2%)	N/A	N/A	22
Childhood AIE Males	7 (31.8%)	N/A	N/A	22

Note. The age range in the sample was 18-29 years.

Figure 2

Youngest Age and Oldest Age at which an AIE Occurred (n = 53)



Note. The mean age is indicated by the orange dashed line.

Table 2

Means and Standard Deviations of Predictor and Outcome Variables

Variable	Mean (*SD*) (N = 87)	Mean (*SD*) AIE (n = 55)	Mean (*SD*) no AIE (n = 33)	Mean (*SD*) Childhood AIE (n = 22)
Trait Dissociation	1.88 (0.43)	1.88 (0.40)	1.88 (0.49)	1.93 (0.40)
Consolidated Identity	4.95 (0.64)	5.01 (0.64)	4.85 (0.64)	5.15 (0.56)
Disturbed Identity	2.99 (0.72)	2.98 (0.73)	2.99 (0.72)	2.79 (0.61)
Lack of Identity	2.54 (1.09)	2.53 (1.15)	2.57 (0.99)	2.37 (1.18)
Problem-focused Coping	2.81 (0.61)	2.86 (0.64)	2.72 (0.57)	2.95 (0.68)

Note. *SD* = standard deviation. AIE = AIE exposed participants. No AIE = Participants who did not report AIE. N/A = not applicable. Trait dissociation (CES) scores ranged from a minimum mean of 1 to 5. The three SCIM identity domains ranged from a 1 to 7. The coping domain scores ranged from 1 to 4. The LEC-5 impact ratings ranged from 1 to 5. The range of the sum score mean of the past impact of a self-experienced AIE was 1-15.

Table 2 (continued)

Means and Standard Deviations of Predictor and Outcome Variables

Variable	Mean (*SD*) (*N* = 87)	Mean (*SD*) AIE (*n* = 55)	Mean (*SD*) no AIE (*n* = 33)	Mean (*SD*) Childhood AIE (*n* = 22)
Emotion-focused Coping	2.45 (0.41)	2.48 (0.44)	2.40 (0.36)	2.56 (0.52)
Avoidant Coping	1.78 (0.40)	1.75 (0.40)	1.83 (0.40)	1.68 (0.32)
AIE Past Impact (Self)	N/A	3.59 (1.10)	N/A	3.72 (1.09)
AIE Past Impact (Witness)	N/A	3.1 (1.06)	N/A	3.32 (0.97)
AIE Present Impact (Self)	N/A	2.11 (1.05)	N/A	2.37 (1.21)
AIE Present Impact (Witness)	N/A	1.75 (0.81)	N/A	1.99 (1.06)

Note. *SD* = standard deviation. AIE = AIE exposed participants. No AIE = Participants who did not report AIE. N/A = not applicable. Trait dissociation (CES) scores ranged from a minimum mean of 1 to 5. The three SCIM identity domains ranged from a 1 to 7. The coping domain scores ranged from 1 to 4. The LEC-5 impact ratings ranged from 1 to 5. The range of the sum score mean of the past impact of a self-experienced AIE was 1-15.

Table 2 (continued)

Means and Standard Deviations of Predictor and Outcome Variables

Variable	Mean (*SD*) (N = 87)	Mean (*SD*) AIE (n = 55)	Mean (*SD*) no AIE (n = 33)	Mean (*SD*) Childhood AIE (n = 22)
Change Between AIE Sum of Past and Present Impact	N/A	2.13 (1.54)	N/A	2.14 (1.86)
AIE Past Impact (Sum Score)	N/A	5.5 (3.25)	N/A	6.45 (3.76)

Note. *SD* = standard deviation. AIE = AIE exposed participants. No AIE = Participants who did not report AIE. N/A = not applicable. Trait dissociation (CES) scores ranged from a minimum mean of 1 to 5. The three SCIM identity domains ranged from a 1 to 7. The coping domain scores ranged from 1 to 4. The LEC-5 impact ratings ranged from 1 to 5. The range of the sum score mean of the past impact of a self-experienced AIE was 1-15.

Table 3

Frequencies of Adverse Experiences and Means and Standard Deviations for Past and Present Impact (N = 87)

Adverse Experience	Frequency, Self	Mean (*SD*) Impact Past, Self	Mean (*SD*) Impact Now, Self	Frequency, Witness	Mean (*SD*) Impact Past, Witness	Mean (*SD*) Impact Now, Witness
Natural Disaster	12	1.83 (0.83)	1.36 (0.92)	7	2.29 (1.11)	1.86 (1.21)
Fire or Explosion	9	3.22 (1.20)	1.33 (0.5)	22	2.54 (0.96)	1.04 (0.21)
Transportation Accident	24	2.74 (1.05)	1.39 (0.72)	26	2.35 (1.20)	1.38 (0.70)
Serious Accident	21	3.76 (0.94)	1.86 (0.79)	25	3.08 (1.02)	1.5 (0.81)
Exposure to Toxic Substance	5	2 (0.71)	1.2 (0.45)	5	2.6 (0.55)	1.4 (0.55)
Physical Assault*	31	3.52 (1.23)	1.89 (0.93)	39	2.97 (1.18)	1.64 (0.84)
Assault with Weapon*	1	4 (N/A)	2 (N/A)	7	3.43 (0.98)	1.43 (0.53)
Sexual Assault*	11	4.82 (0.40)	3.45 (0.93)	9	3.75 (1.39)	2.75 (0.71)

Note. *SD* = Standard deviation. AIE are marked with an asterisk. Life events without reported occurrences are marked with not applicable (N/A).

Table 3 (continued)

Frequencies of Adverse Experiences and Means and Standard Deviations for Past and Present Impact (N = 87)

Adverse Experience	Frequency, Self	Mean (*SD*) Impact Past, Self	Mean (*SD*) Impact Now, Self	Frequency, Witness	Mean (*SD*) Impact Past, Witness	Mean (*SD*) Impact Now, Witness
Unwanted Sexual Experience*	39	3.43 (1.15)	2.23 (1.25)	21	2.95 (0.97)	1.86 (1.11)
Combat Exposure	0	N/A (N/A)	N/A (N/A)	3	3.33 (2.08)	2 (1)
Captivity	0	N/A (N/A)	N/A (N/A)	0	N/A (N/A)	N/A (N/A)
Life-Threatening Illness	10	3.8 (1.55)	1.8 (0.79)	52	3.96 (1.10)	2.19 (1.14)
Severe Human Suffering	10	4.9 (0.32)	2.6 (1.07)	24	3.83 (0.86)	2.69 (1.30)
Sudden Violent Death	0	N/A	N/A	8	3.38 (1.60)	2 (0.76)
Sudden Accidental Death	3	3.5 (0.71)	1.5 (0.71)	9	3.7 (1.16)	2.4 (1.35)
Harm Caused to Another	5	3.4 (1.14)	1.6 (0.89)	2	2.5 (0.71)	1 (0)
Other	16	4 (1)	2.33 (1.23)	20	3.68 (1.18)	2.08 (1.18)

Note. *SD* = Standard deviation. AIE are marked with an asterisk. Life events without reported occurrences are marked with not applicable (N/A).

Hypothesis 1a

Although it was assumed that AIE would be associated with lack of identity, zero-order correlations revealed that the association between the past impact of AIE and lack of identity was not statistically significant ($r = 0.06$, $p = .67$). Trait dissociation showed small positive correlations with lack of identity ($r = 0.22$, $p = .04$) (Figure 3) and disturbed identity ($r = 0.24$, $p = .03$) in the entire sample ($N = 87$). Although the past impact of AIE correlated moderately with trait dissociation ($r = 0.38$, $p < .001$) in the sample of the original study ($N = 194$), the past impact of AIE did not correlate significantly with trait dissociation ($r = 0.09$, $p = .48$) in the subsample included in the present study ($N = 87$).

Regression model 1a was built starting with the main effect between the past impact of AIE and lack of identity. The fitted model with the past impact of AIE and trait dissociation as predictors explained 2.67% of the variance in lack of identity (Model 1a, Table 4). Neither the past impact of AIE nor trait dissociation significantly predicted lack of identity. However, trait dissociation exhibited a noticeable positive trend ($\beta = 0.70$, $SE = 0.39$, $t(52) = 1.82$, $p = .08$). Adding the control variable years since the latest AIE resulted in a non-significant association ($\beta = -0.02$, $SE = 0.04$, $t(49) = -0.63$, $p = .53$) and a reduction of the explained variance to 0.98%. Years since the latest AIE was consequently not included in the fitted model. The results of the mediation analysis indicated that trait dissociation does not mediate the relationship between the past impact of AIE and lack of identity. Testing the indirect effect between the mediator trait dissociation and the past impact of AIE revealed no statistically significant mediation effect ($\beta = 0.01$, $p = .59$, 95% confidence interval [-0.02, 0.05]). The average direct effect of the past impact of AIE on lack of identity suggested a non-significant effect ($\beta = 0.01$, $p = .84$, 95% confidence interval [-0.10, 0.14]). The total effect between the past impact of AIE and lack of identity was also not statistically significant ($\beta = 0.02$, $p = .71$, 95% confidence interval [-0.08, 0.13]). The proportion mediated was estimated at 0.41. The 95% confidence interval [-2.92, 4.34] included zero and also the large p-value ($p = .97$) suggests that the proportion mediated is not statistically different from zero.

Using a value of 4/55 = 0.07 as a threshold for Cook's Distance showed that observations 7, 13, 49, and 60 are outliers. Removing these observations from the final model increased the explained variance to 9%. The noticeable trend between trait dissociation and lack of identity became statistically significant in the model without outliers ($\beta = 0.94$, $SE = 0.35$, $t(48)$, $p = .01$, 95% confidence interval [0.25, 1.63]), suggesting that trait dissociation

correlated positively with lack of identity. This association remained statistically significant after applying the Bonferroni correction. The AIC of the model without outliers (AIC = 145.59) was smaller than the AIC of the model with outliers (AIC = 175.75), suggesting that removing the outliers led to better model fit. The variance inflation factor (VIF) for the variables in the final model were all below 1.5, suggesting no significant multicollinearity.

Hypothesis 1b

In line with expectations, lack of identity exhibited a small negative correlation with problem-focused coping (r = -0.23, p = .03) (Figure 4). Notably, emotion-focused coping exhibited a large correlation (r = 0.57, p < .001) with problem-focused coping, suggesting that participants who used one kind of coping strategy also used the other. Zero-order correlations further revealed that avoidance-focused coping exhibited a large positive correlation with lack of identity (r = 0.55, p < .001), a small positive correlation with disturbed identity (r = 0.28, p = .01), and a large negative correlation with consolidated identity (r = -0.54, p < .001). These results suggest that avoidance of stressful life experiences goes together with identity disturbances.

Regression model 1b revealed that the past impact of AIE was not a statistically significant predictor of lack of identity when problem-focused coping was also in the model (Model 1b, Table 4). The regression coefficient for problem-focused coping indicated a negative non-significant trend with lack of identity (β = -0.36, SE = 0.25, t(52) = -1.47, p = .15), suggesting that participants with greater problem-focused coping scores had lower lack of identity scores. The explained variance of the fitted model was less than 1%. Adding the control variable years since the latest AIE led to a negative adjusted R-squared value, and this variable was therefore not included in the fitted model. Regarding the mediation analysis, the average indirect mediation effect was statistically not significant (β = -0.002, p = .82, 95% confidence interval [-0.03, 0.02]). The average direct effect between the past impact of AIE and lack of identity was also statistically non-significant (β = 0.02, p = .71, 95% confidence interval [-0.08, 0.14]). The total effect between the past impact of AIE and lack of identity was also not statistically significant (β = 0.02, p = .76, 95% confidence interval [-0.18, 0.14]). The proportion mediated was estimated at -0.10. The 95% confidence interval [-1.34, 2.20] included zero and the large p-value (p = 1) suggests that the proportion mediated is statistically not different from zero. This suggests that in the current sample problem-focused coping did not mediate between the past impact of AIE and lack of identity.

Figure 3

Correlation Between Lack of Identity and Trait Dissociation (N = 87)

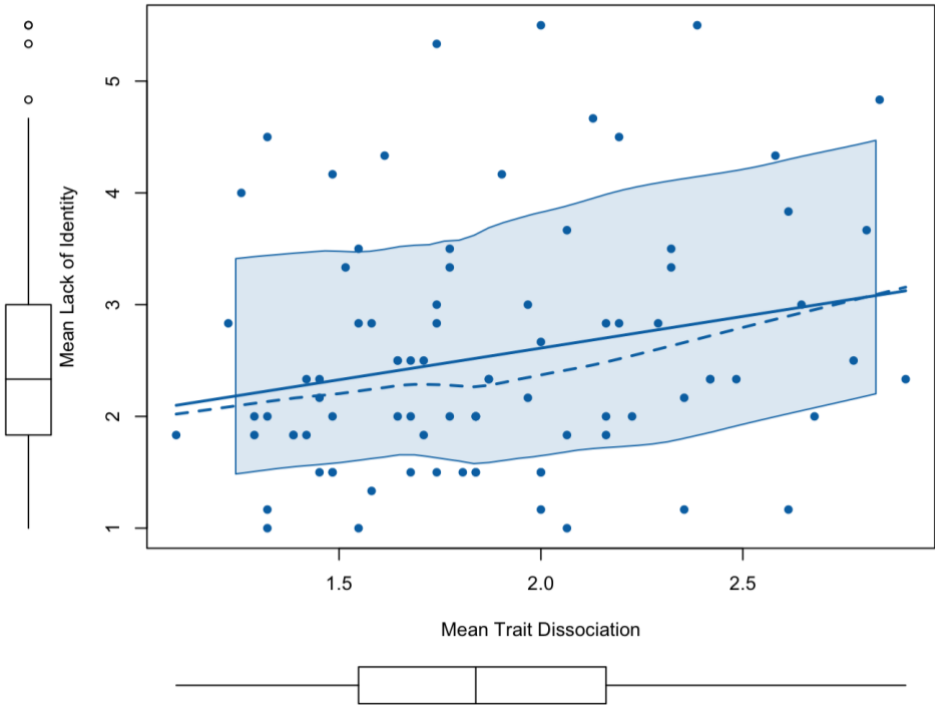
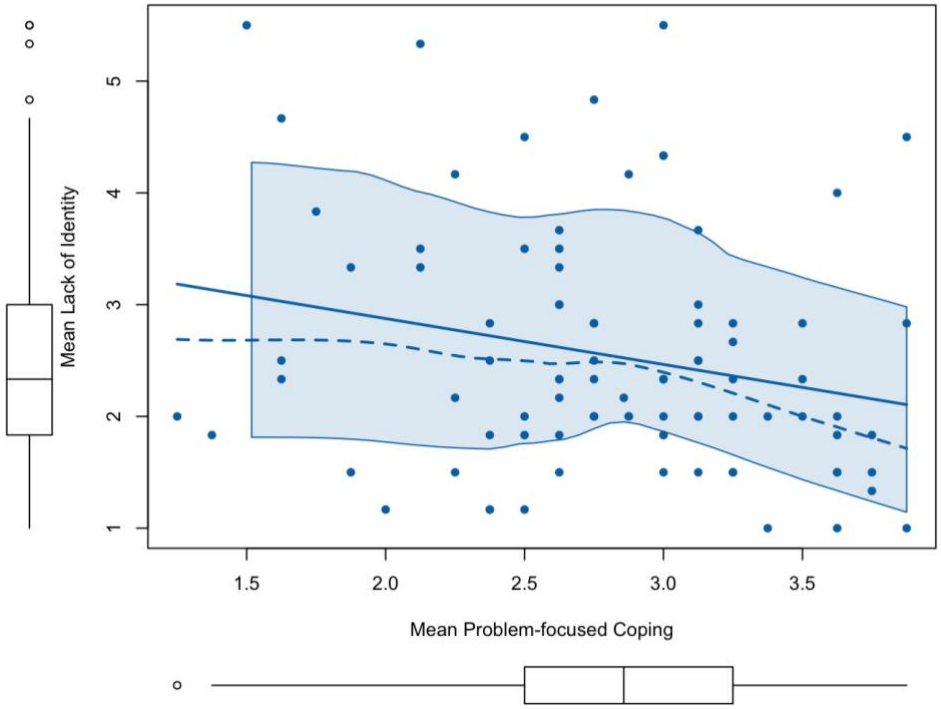


Figure 4

Correlation Between Lack of Identity and Problem-focused Coping (N = 87)



Observations 7, 13, and 60 were identified as potential outliers. Of these, all three observations were above the threshold of 0.07 in terms of Cook's Distance. The AIC value of the model without outliers was smaller (AIC = 154.29) than the AIC of the model with outliers (AIC = 176.89). Removing these outliers increase the explained variance to 1%. The analysis of multicollinearity did not reveal any problematic multicollinearity among the variables included in the model.

Hypothesis 2

Contrary to expectations, zero order correlations revealed no significant association between childhood AIE and lack of identity. There was also no significant correlation between childhood AIE and consolidated identity (Figure A-1). There was a trend between childhood AIE and disturbed identity (r = -0.23, p = .10), suggesting that childhood AIE in this sample were not associated with psychopathological identity development.

The second regression model suggests that childhood AIE did not predict lack of identity when controlling for the sum of past impact of AIE (Model 2, Table 4). The explained variance of the model was -2%, suggesting that the model does not fit the data well. Years since the latest AIE was not included in the fitted model because adding this control variable decreased model fit.

Outlier detection suggested that observations 7, 13, and 60 are influential. The model without outliers had lower AIC than the model with outliers but removing the outliers reduced the explained variance to -4%. The test for multicollinearity suggested no problematic multicollinearity.

Hypothesis 3

The third regression model explained 22% of the variance of the difference between the past and present impact of AIE. Contrary to what was hypothesized, neither trait dissociation nor disturbed identity or lack of identity significantly predicted the difference between the past and present impact when controlling for the past impact and years since the latest AIE (Model 3, Table 4). This suggests that the hypothesized predictors did not perpetuate the impact of AIE. The past impact of AIE significantly predicted the difference between the past and present impact of AIE in the fitted model (β = 0.22, SE = 0.06, t(47) = 3.64, p < .001). This association remained significant after the Bonferroni correction. The regression coefficient suggests that participants with greater past impact of AIE reported a greater difference between the past and present impact of AIE. The 95% confidence interval [0.10, 0.34] suggests a small but significant effect. Notably, when including three predictors

(disturbed identity, trait dissociation, and lack of identity) in the model, disturbed identity exhibited a non-significant trend association with the difference between the past and present impact of AIE (β = -0.67, *SE* = 0.34, *t*(51) = -1.96, *p* = .06). The regression coefficient suggests that participants who scored higher on disturbed identity had a smaller difference between the past and present impact of AIE when not controlling for the past impact of AIE and years since the latest AIE.

Outlier detection suggested that observations 49, 58, and 60 are outliers in terms of Cook's distance. The fitted model without outliers had an AIC of 167.52 compared to 192.67 for the model with outliers. The explained variance increased to 36% after removing outliers. The VIF for the third model suggested that disturbed identity and lack of identity correlate, but the VIF values did not indicate problematic multicollinearity.

Post-Hoc Analyses

An exploratory post-hoc multiple linear regression analysis was run after observing the correlation between trait dissociation and lack of identity. In this model, trait dissociation was the dependent variable, the sum of the past impact of AIE was the predictor, and lack of identity was entered as a moderator. The model resulted in a statistically significant association between the past impact of AIE and trait dissociation (β = 0.09, *SE* = 0.03, *t*(51) = 2.88, *p* < .05, 95% confidence interval [0.03, 0.15]). Lack of identity also significantly predicted trait dissociation (β = 0.28, *SE* = 0.08, *t*(51) = 3.50, *p* < .05, 95% confidence interval [0.13, 0.44]). Furthermore, lack of identity moderated between the past impact of AIE and trait dissociation (β = -0.03, *SE* = 0.01, *t*(51) = -2.92, *p* < .05, 95% confidence interval [-0.05, -0.01]). The model explained 15.4 % of the variance in trait dissociation.

A second post-hoc analysis was run with all coping domains entered as predictors in model 1b. In this model avoidance-focused coping significantly predicted lack of identity (β = 1.48, *SE* = 0.35, *t*(50) = 3.50, *p* < .05, 95% confidence interval [0.78, 2.17]).

Table 4

Comparison of the Regression Models (Including Outliers)

	Model 1a					Model 1b				
Variable	Coefficient	SE	CI	*t*	*p*	Coefficient	SE	CI	*t*	*p*
AIE Past	0.01	0.05	[-0.09, 0.11]	0.25	0.80	0.02	0.05	[-0.08, 0.12]	0.47	0.64
Dissociation	0.70	0.39	[-0.06, 1.46]	1.82	0.08					
Problem C.						-0.36	0.25	[-0.85, 0.13]	-1.47	0.15
Years since										
$R^2_{adjusted}$	0.03					0.006				

	Model 2					Model 3				
Variable	Coefficient	SE	CI	*t*	*p*	Coefficient	SE	CI	*t*	*p*
AIE Past	0.03	0.05	[-0.09, 0.15]	0.48	0.63	0.22	0.06	[0.10, 0.34]	3.64	0.001
Dissociation						-0.57	0.48	[-1.51, 0.37]	-1.18	0.25
Lack of I.						0.25	0.20	[-0.14, 0.64]	1.24	0.22
Disturbed I.						-0.49	0.31	[- 1.10, 0.12]	-1.56	0.13
Childhood	-0.34	0.33	[-0.68, 0.61]	-1.01	0.32					
Years since						0.02	0.04	[-0.06, 0.10]	0.48	0.64
$R^2_{adjusted}$	-0.02					0.22				

Discussion

This study's primary aim was to investigate whether trait dissociation or problem focused coping mediate the relationship between AIE and lack of identity. A secondary aim was to explore whether childhood AIE predict lack of identity. The final aim was to explore whether trait dissociation and identity-disturbances maintain the impact of AIE. Although the results provide only partial support for the proposed model and hypotheses, several noteworthy findings warrant discussion.

The Association Between the Past Impact of AIE and Lack of Identity

With regard to the first research question and hypothesis 1a, participants reporting greater past impact of AIE did not report greater lack of identity. The hypothesized mediating role of dissociation was also not found. However, there was a positive association between trait dissociation and lack of identity when the entire sample was considered. This supports the notion that the small sample size may have hindered the detection of this association in AIE-exposed participants. Moreover, the trend in model 1a linking dissociation and lack of identity further suggests that the association may have reached statistical significance with a larger AIE sample. Furthermore, the fact that there were no significant differences in dissociation scores between participants who reported AIE and those who did not suggests that dissociation is not exclusively related to AIE. This aligns with the proposal by Chiu et al. (2017) and Lynn et al. (2022) that there is a general connection between an altered sense of identity and dissociation. Furthermore, the current sample included a wide range of dissociative symptoms comparable to the sample by Chiu et al. (2017) which suggests that identity disturbances may be a manifestation of dissociation (including non-pathological dissociation) and are not necessarily related to the experience of AIE. It can therefore be inferred that the association exists not only within clinical populations but also in non-clinical populations.

The findings regarding hypothesis 1b did not support the hypothesized second pathway which predicted that problem-focused coping mediates between the past impact of AIE and lack of identity. Consistent with the model, problem-focused coping was negatively associated with lack of identity, suggesting that knowing how to deal with adverse experiences can have beneficial effects for one's identity (or vice versa). However, among participants exposed to AIE, problem-focused coping did not predict lack of identity and did not mediate between the past impact of AIE and lack of identity. Nevertheless, avoidance-focused coping was related to lack of identity in the results of the post-hoc analysis. These results suggest that coping is not the link between AIE and identity disturbances, but that

coping is nonetheless related to identity. The proposed model may thus need to be reconsidered.

An alternative explanation is that individuals with a more integrated (or consolidated) identity may rely more on adaptive coping strategies rather than dissociation. When faced with adverse experiences, identity could moderate how individuals cope (Chiu et al., 2017). As suggested by Lassri et al. (2023), an integrated identity could protect against the development of dissociative symptoms after an AIE. AIE may disturb identity when the individual is not able to integrate the traumatic experience into a personal narrative and thus fails to integrate it into their self-concept. The resulting identity disturbance could explain inadequate coping (e.g., dissociation) with life stressors as suggested by Lassri et al. (2023). If the model proposed by Lassri et al. (2023) is valid, then the interaction between AIE and lack of identity should be positively related to dissociation. The first exploratory post-hoc analysis provided preliminary support for this model. Dissociation may therefore be better conceptualized as an outcome of the interaction of AIE and identity disturbances, while identity can be seen as a moderator. However, it is difficult to differentiate between dissociation and the failure of integration of adverse experiences into the self-concept. As Lynn et al. (2022) proposed, dissociation can be defined as a failure of adaptive functions. The model by Lassri et al. (2023) does not address by which mechanism identity disturbances come to be. Considering the transdiagnostic model proposed by Lynn et al. (2022) and the existing literature linking AIE, changes in identity, and dissociation (Frewen et al., 2020; Lanius et al., 2020), it is possible that dissociation plays a moderating role in the relationship between AIE and identity and that identity disturbances in turn maintain dissociative coping with stressors by inhibiting adaptive functions, such as emotion regulation abilities (cf. Kaufman et al., 2015). Without information about temporal precedence, the causal relationships remain unclear.

Childhood AIE as a Predictor of Lack of Identity

Regarding the second research question and hypothesis 2, contrary to what was expected, childhood AIE did not predict lack of identity. This unexpected result contrasts with previous studies that frequently established a link between childhood AIE and identity disturbances (e.g., Lanius et al., 2020). One potential explanation is that childhood AIE alone may not be sufficient to cause lack of identity unless interacting with a predisposition toward dissociation and other factors not accounted for in the current study. For example, dissociation and other maladaptive coping strategies are more likely to occur in individuals who grew up in adverse family environments (Narang & Contreras, 2005; Paetzold & Rholes,

2021) and have a poor understanding of their identity (Lassri et al., 2023). The type of environment may be a third variable which influences identity development, coping styles, and dissociation proneness. Another plausible explanation for the absence of an association between childhood AIE and lack of identity is that participants were relatively more resilient with an overall more consolidated identity and thus were able to cope with AIE more effectively (cf. Kaufman et al., 2015). Importantly, the present study assessed the impact of AIE *after* participants had lived through possibly traumatic experiences and had decided to become psychology students. This suggests that some participants may have construed narratives through which they could integrate adverse experiences into their self-concept and thereby experience post-traumatic growth. Munroe et al. (2022) linked post-traumatic growth to problem-focused coping strategies and self-compassion. Consequently, participants in this study may possess a clearer understanding of their identity, thereby diminishing the adverse impact of childhood AIE on identity. However, the results suggest that childhood AIE did not play a significant role in developing a consolidated identity. Nonetheless, the observed trend between the experience of childhood AIE and disturbed identity suggests that childhood AIE may have some impact on identity. However, other factors can buffer this effect. For example, Nijenhuis and van der Hart (2011) pointed out that dissociative coping when dealing with memories of childhood AIE could result in the *appearance* of a consolidated identity which compensates a disturbed identity. Individuals may struggle to accept their own vulnerability as a child and compensate this by identifying with a strong opposition to the vulnerable child they once were (e.g., "I am not that vulnerable person") (Nijenhuis & van der Hart, 2011). Similar reasoning may have been employed by participants in the current sample, which could explain the trend between disturbed identity and childhood AIE and the counterintuitive negative correlation between childhood AIE and lack of identity (Figure A-1).

Trait Dissociation, Identity Disturbances, and the Change in Impact of AIE

Regarding the third research question and hypothesis 3, dissociation and identity disturbances did not predict the difference between the past and present impact of AIE. This unexpected result contradicts the expectation that trait dissociation and identity disturbances contribute to suboptimal coping with AIE as reported by Lassri et al. (2023). Nevertheless, the negative trend between disturbed identity and the difference between the past and present impact of AIE may hold practical significance by suggesting that identity disturbances play some role in perpetuating the impact of adverse experiences (see Figure A-1). However, the

low frequency of high scores on lack of identity and the small sample size limit the generalizability of these findings.

Limitations and Strengths

One important limitation of the present study is the small sample size, which limits statistical power and may explain the absence of statistically significant associations. It is plausible that the hypothesized associations exist, but due to the sample size, they were not detected in this study. For example, the trend between trait dissociation and lack of identity suggests that dissociation and identity disturbances are linked. Similarly, the past impact of AIE and trait dissociation correlated moderately in the sample of the original study but not in the subsample of participants that completed the add-on study. This suggests that the subsample of the add-on study differed from the sample of the original study. Notably, there were no significant differences in terms of dissociation or identity between participants who reported AIE and those who did not, suggesting that some of the hypothesized associations may exist in the population of interest but the reduced sample size in the subset analysis obscured these associations. As a result, it is crucial to interpret the findings of this study with caution and consider their limited reliability and generalizability.

Secondly, the sample may be different from samples in other studies in terms of identity and coping. The sample consisted of undergraduate students who likely have the availability of some roles (i.e., student, friend) which reduces the likelihood of experiencing lack of identity. The current sample was comparable to the undergraduate sample recruited by Chiu et al. (2017) in terms of educational level, age, and gender. Similar to the positive correlation between trait dissociation and lack of identity in the current sample, Chiu et al. (2017) found that dissociation proneness was associated with a less clear self-concept. However, Chiu et al. (2017) did not provide data on the distribution of identity development in their sample. Comparing the current sample to the undergraduate sample by Kaufman et al. (2015) who provided information on identity development distributions suggests that participants in the current sample scored relatively high on the consolidated identity domain and low on the disturbed and lack of identity domains (see skewness and kurtosis, Appendix B). As Kaufman et al. (2015) reported, consolidated identity development enables individuals to navigate life's major challenges. The reported difficulties may thus represent normal age-appropriate difficulties with identity. The relatively low explained variance observed in relation to lack of identity suggests that unmeasured variables, such as emotion regulation abilities, may contribute to the variability of this outcome. As Briere et al. (2010) suggested, it is not the impact of adverse events alone that predicts coping responses such as

dissociation, but whether the event overwhelms emotion regulation abilities. Undergraduate psychology students may be on average more problem-focused when dealing with life stressors (Hartmann & Ertl, 2021), and problem-focused coping abilities could indicate high emotion regulation abilities which are important in counteracting the failure of adaptive functions (i.e., dissociation) (cf. Roberts & Reuber, 2014). Participants in the current sample reported little avoidance-focused coping and relied mostly on problem-focused and emotion-focused coping when compared to other samples of participants exposed to traumatic events (e.g., Brooks et al., 2019). According to Munroe et al. (2022), when faced with a stressful situation, individuals may feel motivated to engage in problem-focused coping and seek new meanings which buffers against negative consequences from adverse experiences. The ability to cope effectively makes avoidance (or dissociation) less likely (cf. Dias et al., 2012) and this could prevent identity disturbances that result from an inability to integrate adverse experiences. Consequently, the exploration of identity disturbances may be limited in this study.

Thirdly, there are limitations inherent in the design of the LEC-5. Firstly, the cross-sectional self-report assessment of the impact in the adapted version of the LEC-5 introduces potential biases and may not accurately reflect the true impact of the events in the past. In addition, the difference between the past and present impact could have interacted with coping abilities so that people with adaptive coping strategies experienced less impact. Secondly, the LEC-5 did not specify the meaning of an impact rating of 1 or 5. Consequently, the interpretation of the impact of AIE may have varied among participants, potentially capturing different constructs such as emotional impact or impact on self-esteem. For the purpose of the present research, it would have been more appropriate to inquire about the impact of adverse events on identity. However, due to the adaptation of the LEC-5 for the original study, it was not possible to specify this in the questionnaire. Nevertheless, allowing participants to apply their own interpretation enabled this study to assess subjective impact. Thirdly, the absence of a standardized scoring schema in the LEC-5 poses challenges as there are multiple ways to score the questionnaire, each with its own strengths and weaknesses. Employing various scoring methods such as means, sum scores, or means for clusters of experiences inevitably results in loss of information. Finally, the extent to which the selected items in the LEC-5 accurately capture adverse *interpersonal* experiences is unclear. It is possible that the reported AIE may differ from those documented in the clinical literature. For instance, the perpetrators involved in the reported AIE remain unspecified. It is conceivable that participants' AIE primarily encompass incidental encounters with strangers or second-

degree relatives, rather than the involvement of first-degree relatives as reported in previous studies (e.g., Lassri et al., 2023). Consequently, AIE involving strangers might have a lesser impact on identity, as these events may be less traumatizing.

In addition, there are limitations in the statistical analyses. Firstly, while imputation helped to handle missing data, imputation methods assume missing values are missing at random. This can introduce uncertainty. However, due to the small number of missing items, the influence of imputed values on the variability of the data was judged to be small. Secondly, the variables were treated as continuous variables although the intervals between response options may not be equal. Thirdly, violations of the normality assumption add complexity to the interpretations and limit their generalizability to other samples or the target population. For example, the distributions of consolidated identity and lack of identity were skewed. More than half of participants' scored high on consolidated identity (Figure A-3), and merely 3.45% of participants scored high on lack of identity (Figure A-5). Additionally, adverse experiences varied in their impact, and, as seen in Figure A-2, only few participants experienced multiple AIE. However, non-normal distributions are unsurprising, given that most participants can be expected to have a somewhat clear understanding of their identity and only few participants would be expected to have experienced high impact AIE or multiple AIE. Even if identity and the impact of AIE are normally distributed in the population of interest, the present sample was not representative of this population. These violations of the normality assumption may be exacerbated by the small sample size, making outliers more likely and influential. However, removing outliers was not reasonable since extreme values were expected. As a consequence, the conclusions drawn from the statistical analyses may not be reliable or valid.

One potential approach to address this limitation would have been to dichotomize the (lack of) identity variable into high and low categories. Including both lack of identity and disturbed identity as outcomes could have included a broader spectrum of identity disturbances, given that lack of identity may only represent the most severe forms of psychopathological identity disturbances (Bogaerts et al., 2018). Alternatively, using consolidated identity as an outcome variable may have been more adequate. However, the outcome variable was determined before data collection, before the distribution of (lack of) identity was known. This decision was made to prevent potential bias in the analysis. Similarly, AIE could have been dichotomized into high and low impact events. However, this would have resulted in loss of information. The utilization of a sum score provided more comprehensive information, capturing both high-impact events and the accumulation of

various adverse experiences. Furthermore, due to the small sample size and limited statistical power, logistic regression or other techniques to address non-normal distributions were not feasible. Using a non-parametric robust method for testing all hypotheses, such as bootstrapping as conducted for the mediation analyses in hypothesis 1a and 1b, could have circumvented this limitation.

The present study has several notable strengths. Firstly, it extends the assessment of adverse experiences by examining both past and present impact, which goes beyond the scope of the original version of the LEC-5. This allowed for a more comprehensive understanding of the (long-term) effects of such experiences. Secondly, investigating dissociation as a mechanism whereby identity disturbances develop after traumatic experiences is a novel hypothesis that builds on research by Lassri et al. (2023) and Chiu et al. (2017) who pointed out the close connection between dissociation and identity. Finally, the study contributes to the existing literature on dissociation and adverse experiences by exploring two pathways: Dissociation and problem-focused coping. This novel approach emphasizes the different ways individuals cope with stressors and their potential implications for identity development. The proposed model could serve as the basis for future studies.

Future Research

Future research could assess identity functioning and coping repeatedly over multiple years to study the temporal association between AIE, dissociation, and identity in a larger and more varied sample. A similar approach has been used by Vanderhaegen et al. (2023) to study identity formation in adolescent cancer-survivors. To circumvent difficulties due to the potentially biased past impact ratings, participants could be recruited via trauma centers after a traumatic experience and assessed multiple times over the next years to monitor coping and identity. However, such a study would not be feasible to conduct with children who experienced relational trauma because caregivers involved in abuse may be unwilling to give their consent. To circumvent this limitation, adolescent or adult participants could be screened for the presence of childhood AIE and comparisons could be made between those with childhood AIE and those without in terms of identity development, coping styles, and dissociation. Controlling for the level of adversity of participant's childhood environments could further improve the analysis. To circumvent the limitations of the LEC-5, the instrument could be adapted to enquire about the perpetrator in AIE, and additional questionnaires, such as the Complex Trauma Questionnaire developed by Vergano et al. (2015) could be included to investigate relational trauma in more detail. It remains unclear what the role of dissociation is in the relationship between AIE and identity. To test whether

dissociation is a mediator, moderator, or outcome of the interaction between AIE and identity, future studies could investigate multiple models using structural equation modeling in a large representative sample, allowing for the simultaneous examination of multiple pathways.

Conclusion

This study examined the relationship between AIE, trait dissociation, problem-focused coping, and identity-disturbances in undergraduate students. The current study suggests that the association between identity disturbances and trait dissociation is not limited to samples exhibiting severe dissociation but can also be observed in non-clinical samples. The results further link problem-focused coping to identity, which suggests that the two concepts interact when dealing with life stressors. Although the findings do not support the mediating role of dissociation in the relationship between AIE and identity disturbances, dissociation remains a promising research topic due to its close link with identity. The investigation of lack of identity represents an important and understudied topic within the broader field of research on identity, trauma, and dissociation. Although the current study could not provide evidence for the proposed model, identity disturbances and dissociation potentially play a significant role in perpetuating the impact of traumatic experiences. Understanding the mechanisms whereby the impact of trauma is perpetuated also provides an opportunity to identify predictors of resilience which could become target variables for future treatments. Given the enduring burden of traumatic experiences on individuals, it is crucial to examine potential mechanisms, such as dissociation and identity which could worsen or buffer the impact of traumatic experiences.

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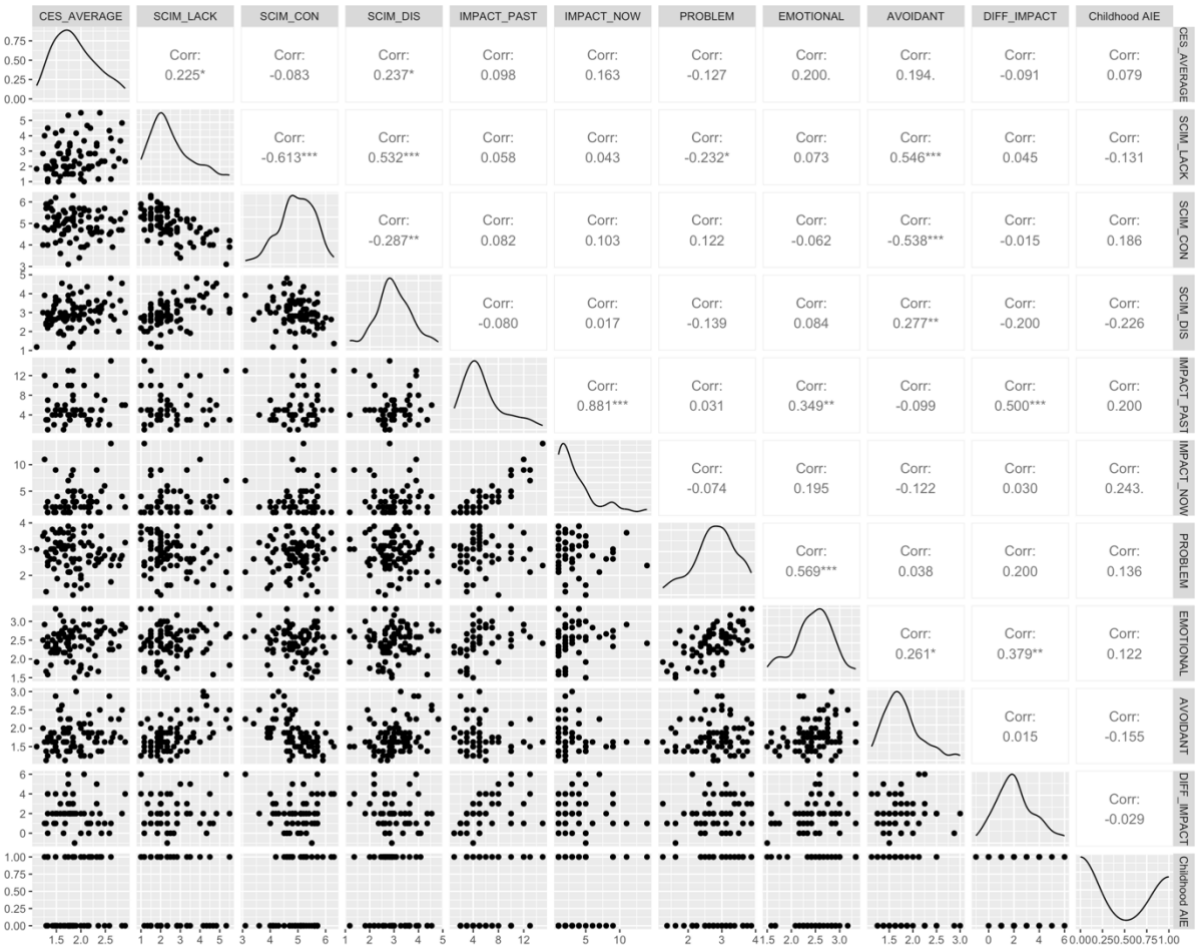
Appendix A: Plots

Figure A-1

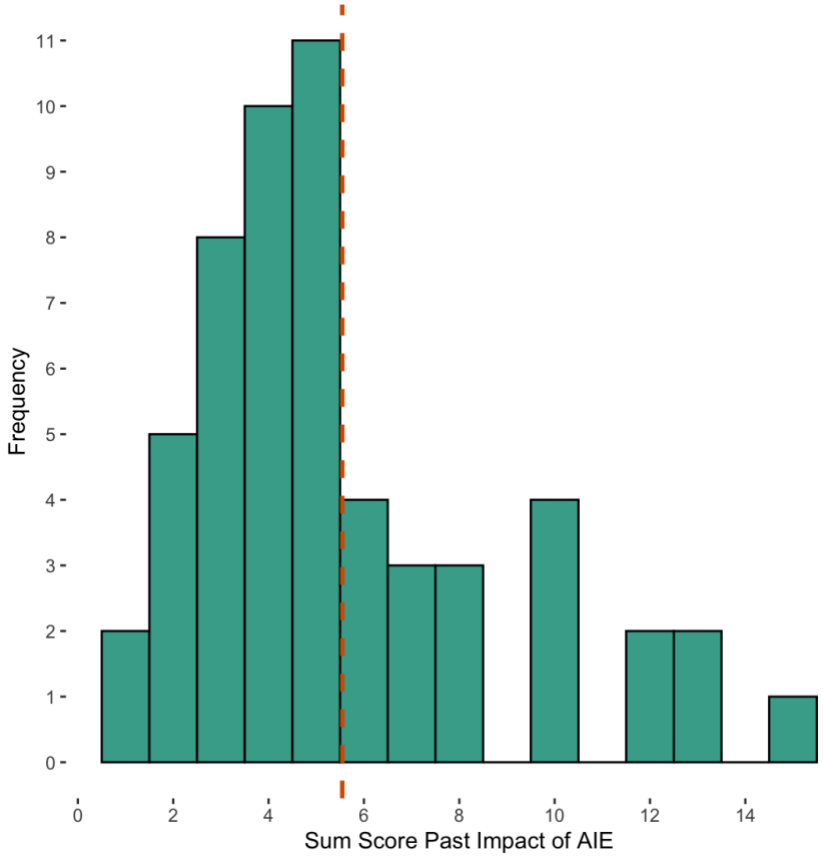
Pairwise Correlation Matrix



Note. *CES_AVERAGE* = trait dissociation average. *SCIM_LACK*, *SCIM_DIS*, *SCIM_CON* = the means of the three SCIM domains: Lack of identity, disturbed, consolidated identity. *IMPACT_PAST* = sum score of past-rated AIE. *IMPACT_NOW* = sum score of present-rated AIE. *PROBLEM, EMOTIONAL, AVOIDANT* = the mean scores of the three coping domains of the Brief-COPE. *DIFF_IMPACT* = the difference between past-rated and present-rated impact of AIE. *Childhood AIE* = the categorical variable for childhood AIE (1 = yes, 0 = no).

Figure A-2

Sum Score of the LEC-5 Past Impact of AIE (n = 55)



Note. The mean is shown by the dashed orange line.

Figure A-3

Histogram of the SCIM Consolidated Identity Domain (N = 87)

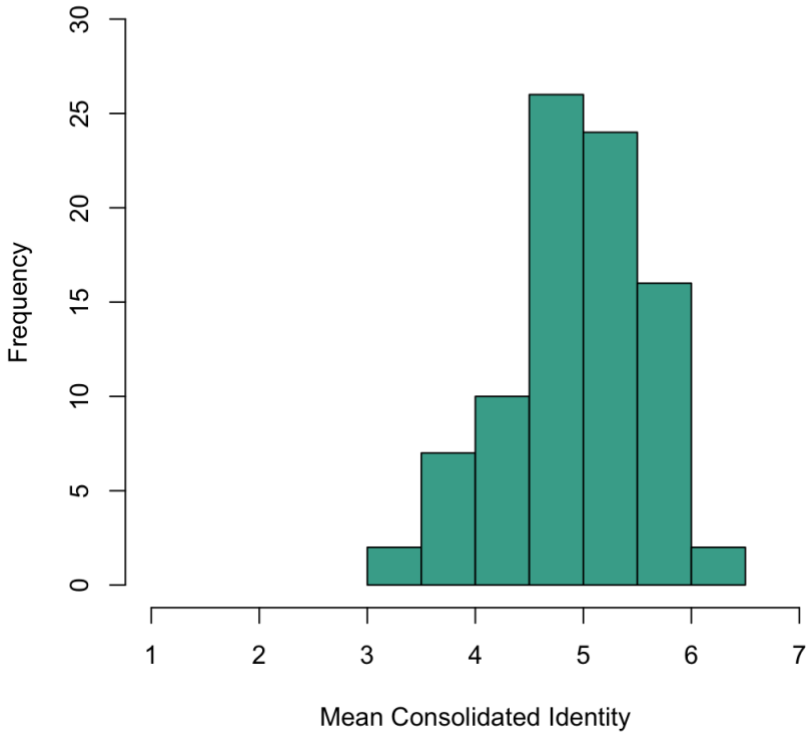


Figure A-4

Histogram of the SCIM Disturbed Identity Domain (N = 87)

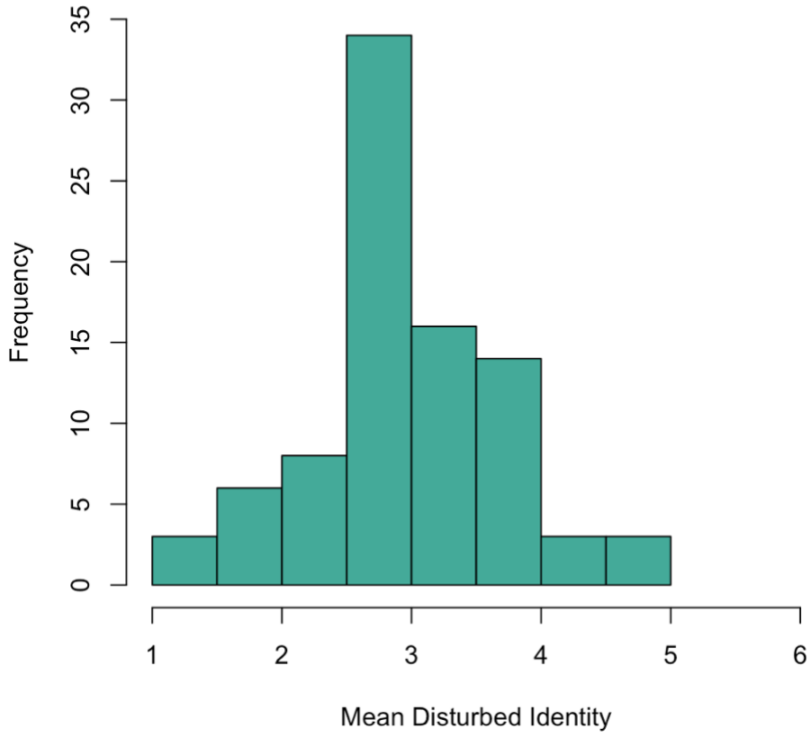


Figure A-5

Histogram of the SCIM Lack of Identity Domain (N = 87)

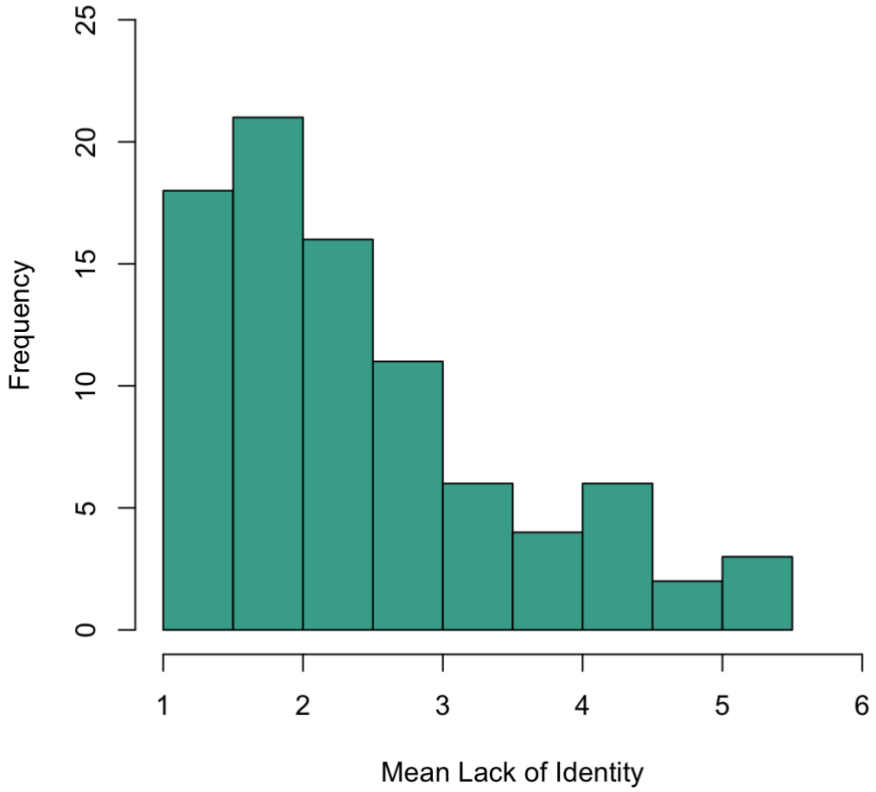


Figure A-6

Histogram of the Problem-Focused Coping Domain (N = 87)

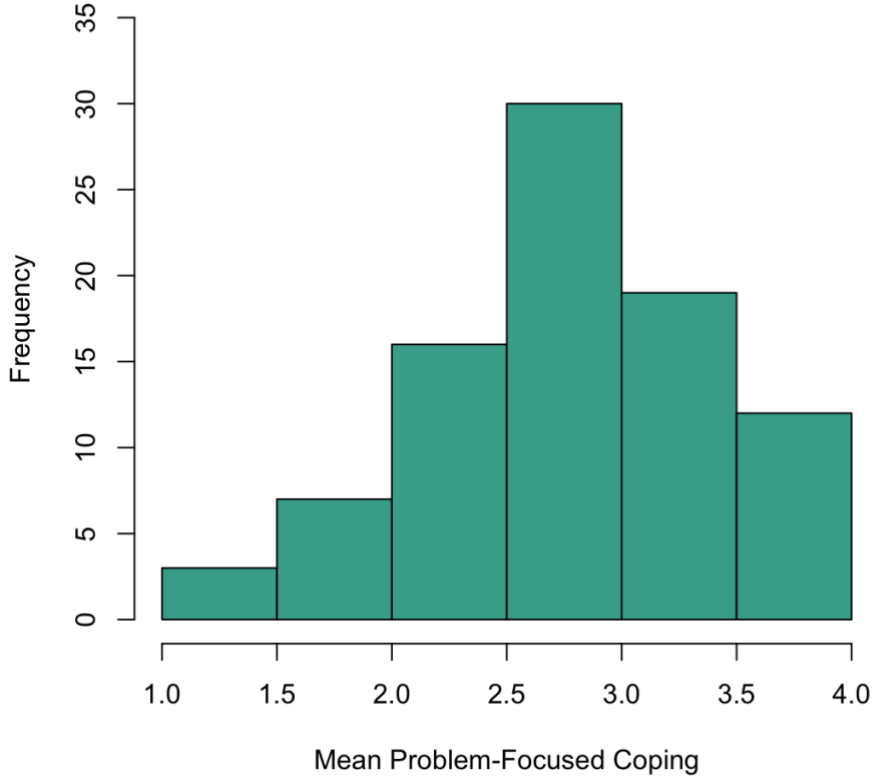


Figure A-7

Histogram of the Emotion-Focused Coping Domain (N = 87)

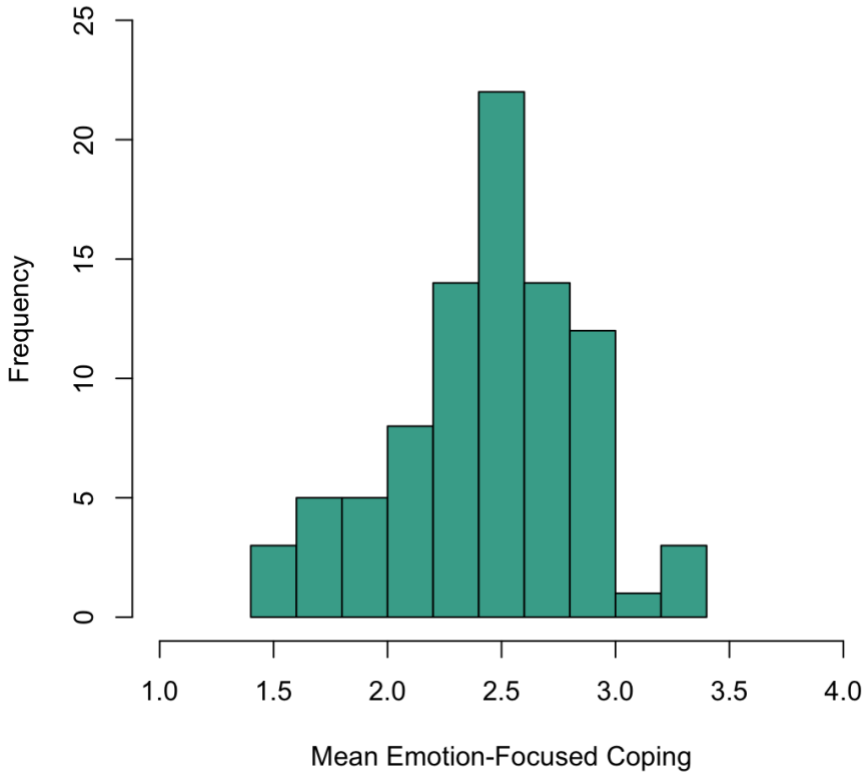
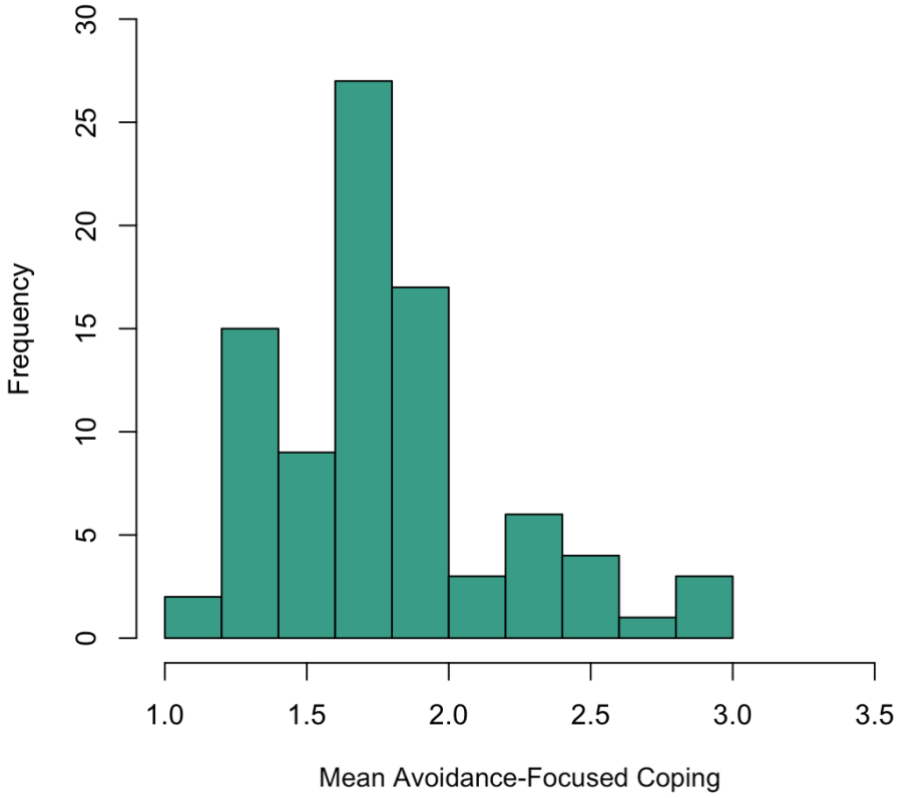


Figure A-8

Histogram of the Avoidance-Focused Coping Domain (N = 87)



Appendix B: Assumption Checks

Assumptions

Regarding model 1a (Figure B-1), the normality assumption appears to be violated, as suggested by the QQ plot and the Shapiro-Wilk test of normality ($W = 0.93$, $p < .01$). The homoscedasticity assumption appears to be not violated and no discernible pattern is visible in the residuals versus fitted plot. The residuals versus leverage plot shows that influential observations (e.g., observation 13, 60) impact the regression model. The assumption of linearity appears to be not violated. The violation of the normality assumption indicates that the model findings are not generalizable.

For model 1b (Figure B-2), the QQ plot of the residuals and the Shapiro-Wilk test of normality ($W = 0.93$, $p < .01$) suggest that the residuals do not follow a normal distribution. The homoscedasticity assumption appears to be not violated. The scale-location plot shows a slightly quadratic pattern. The spread of the residuals changes with values of the predictor variables. The linearity assumption appears to be slightly violated.

Assumption checks of the second model suggest that the linearity assumption is not violated (Figure B-3). The homoscedasticity assumption appears to be not violated in the residuals versus fitted plot. However, the scale-location plot suggests a cubic pattern where the spread of the residuals changes with the values of the predictors. The normality assumption appears to be violated as suggested by the QQ plot and the Shapiro-Wilk test of normality ($W = 0.91$, $p < .01$).

The QQ plot of the third model (Figure B-4) and the Shapiro-Wilk test of normality ($W = 0.98$, $p = .68$) suggest that the normality assumption is not violated. The residuals versus fitted plot and partial residual plots suggest that the linearity assumption is not violated. The Breusch-Pagan test ($BP = 19.86$, df = 5, $p = .001$) suggests that the homoscedasticity assumption is violated. The scale-location plot shows that there is a non-random slightly cubic pattern in the residuals, and an upward trend for higher values of the predictor variables.

Skewness and Kurtosis

The distribution of CES scores was slightly positively skewed (skewness = 0.51, $SE = 0.26$) and exhibited positive kurtosis (kurtosis = 2.47, $SE = 0.53$), reflecting that the distribution was more peaked than a normal distribution with a long tail to the right and most scores being in the lower range.

The SCIM consolidated identity domain exhibited a left-skewed distribution with a concentration of scores toward the higher end (skewness = -0.41, $SE = 0.26$, kurtosis = 2.95,

SE = 0.53). The disturbed identity domain was mostly symmetrically distributed but more peaked than a normal distribution (skewness = 0.04, *SE* = 0.26, kurtosis = 3.28, *SE* = 0.53). Lack of identity was moderately skewed with most scores clustering in the lower range (skewness = 0.93, *SE* = 0.26, kurtosis = 3.22, *SE* = 0.53).

The Brief-COPE problem-focused coping domain exhibited a left-skewed peaked distribution (skewness = -0.39, *SE* = 0.26, kurtosis = 2.75, *SE* = 0.53), suggesting that most participants scored high. The distribution of emotion-focused coping (skewness = -0.27, *SE* = 0.26, kurtosis = 2.81, *SE* = 0.53) was slightly left-skewed which indicates that slightly more participants scored high rather than low. The distribution of avoidance-focused coping (skewness = 0.94, *SE* = 0.26, kurtosis = 3.72, *SE* = 0.53) shows that most participants scored low on avoidance-focused coping.

Figure B-1

Assumption Checks for Model 1a (Hypothesis 1a)

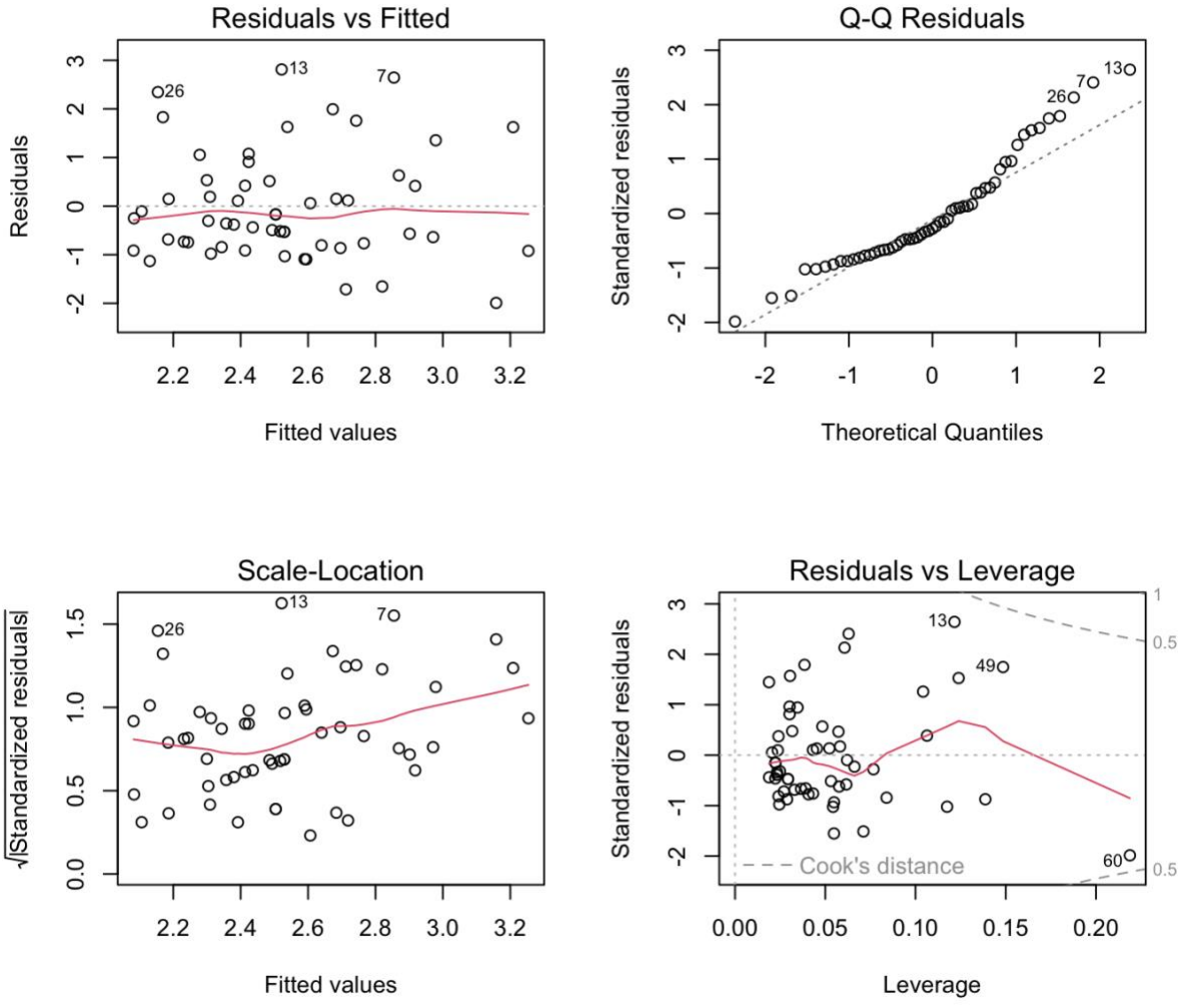


Figure B-2

Assumption Checks for Model 1b (Hypothesis 1b)

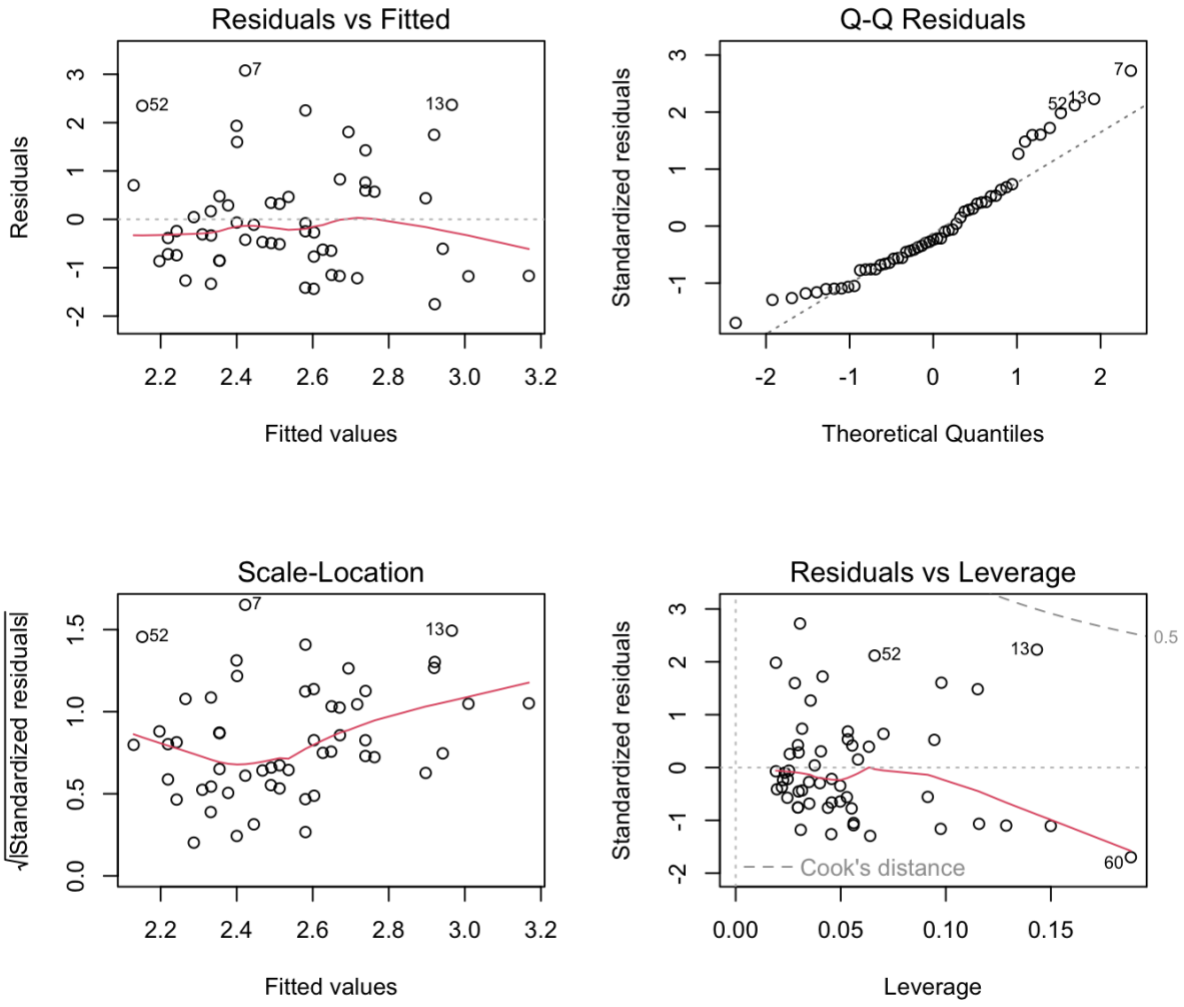


Figure B-3

Assumption Checks for Model 2 (Hypothesis 2)

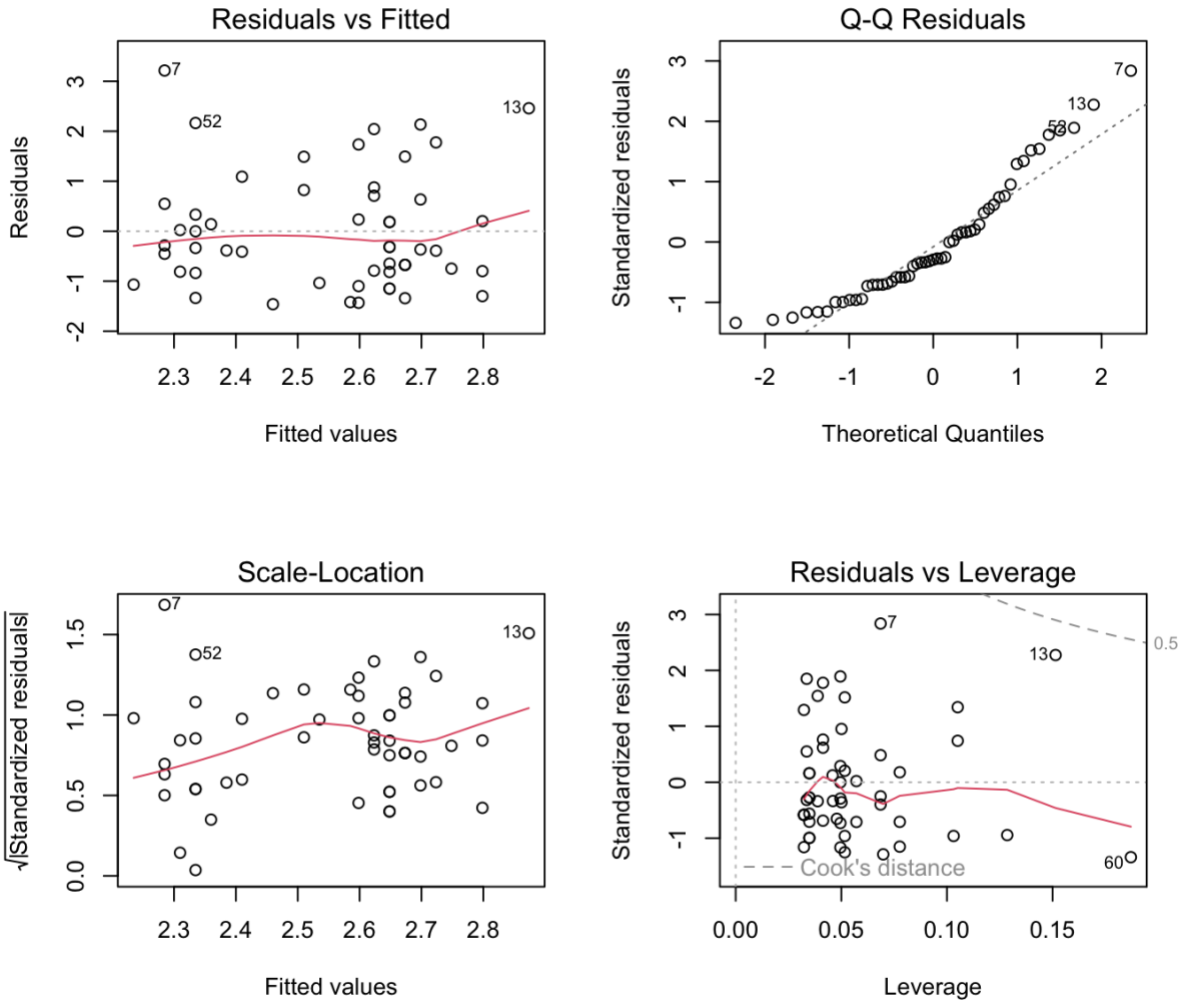
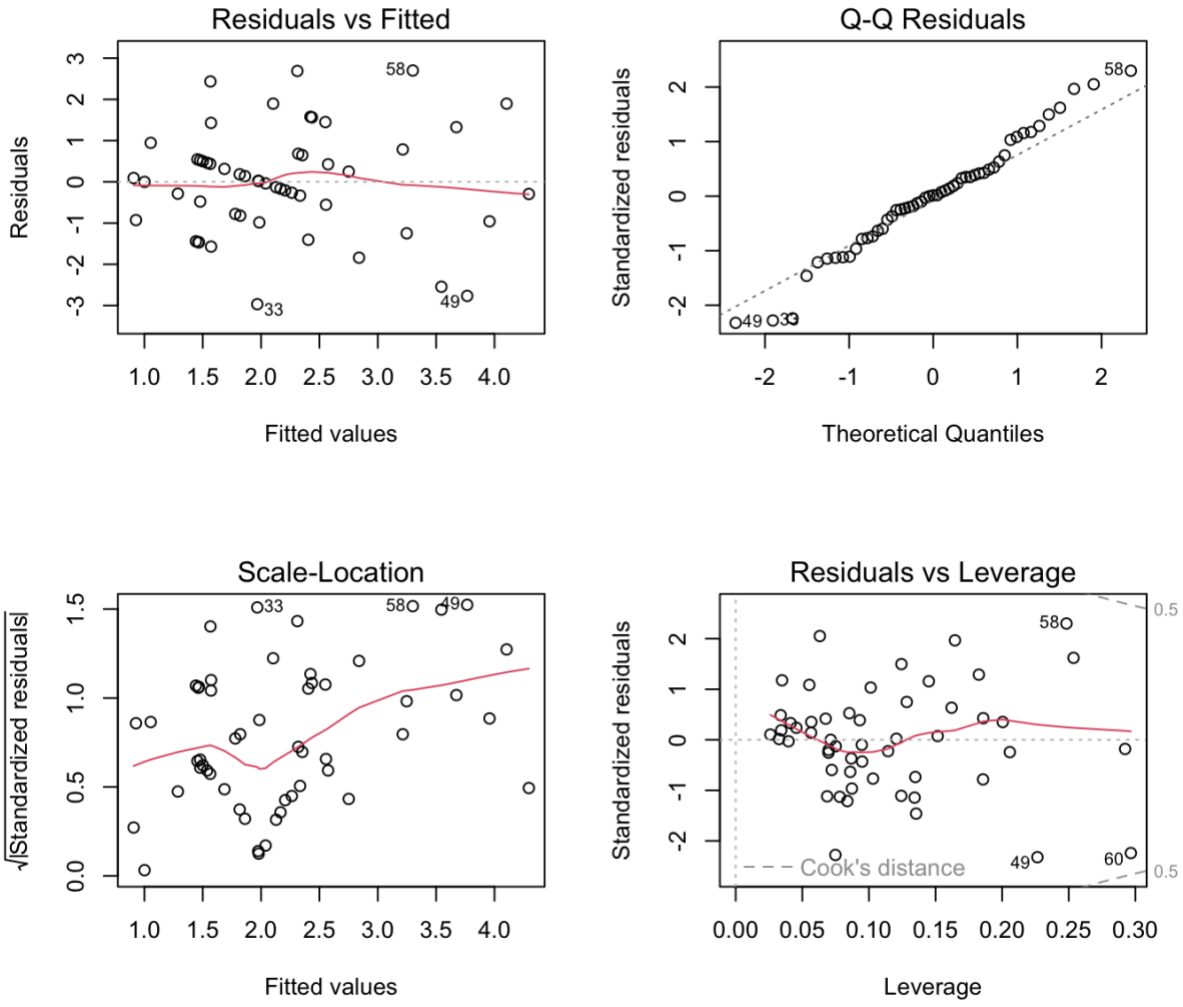


Figure B-4

Assumption Checks for Model 3 (Hypothesis 3)



Appendix C: Reliability

Reliability of CES, SCIM, and Brief-COPE Domains

The CES scale had an alpha score of 0.9, suggesting high internal consistency reliability (cf. Tavakol & Dennick, 2011). The McDonald's Omega score was 0.92 which also suggests high internal consistency reliability. The consolidated identity domain of the SCIM had an alpha score of 0.7 which suggests adequate internal consistency with a higher error variance. The McDonald's Omega score of 0.8 suggests relatively high internal consistency. The disturbed identity domain had an alpha score of 0.75 and a McDonald's Omega of 0.82. The lack of identity domain had an alpha score of 0.88 and a McDonald's Omega of 0.94 which suggests high internal consistency reliability for this domain of the SCIM. The problem-focused coping domain of the Brief-COPE had an alpha score of 0.83 and a McDonald's Omega of 0.92. The emotion focused coping domain had a Cronbach's alpha score of 0.67 and McDonald's Omega of 0.79 which indicates that the items in this domain are less interrelated than the items in the problem-focused coping domain. The avoidance-focused coping domain had an alpha score of 0.64 and a McDonald's Omega estimate of 0.73 which likewise reflects the heterogenous nature of the included items (e.g., substance use, denial).

Appendix D: Data Processing, Complications, and Missing Data Log

Data Processing

The dataset from the original study was combined with the relevant columns from the add-on dataset and the prescreening dataset which contained information about gender. All columns with information unrelated to the current study, such as the columns about the source monitoring task from the original study, were removed. Relevant columns from the three files were combined into the final dataset. All participants who did not complete the add-on study were excluded from the final dataset by searching for matching IDs in both datasets. Identifiable information, such as the SONA IDs of participants were deleted to anonymize the dataset. The assigned ID's were replaced with new IDs not related to the previous IDs.

The following variables were calculated in Microsoft Excel before the statistical analyses in R Studio: two variables for each of the 17 LEC-5 events listing the youngest and oldest reported ages at which the event occurred; sum scores for the past impact of self-experienced AIE; sum scores for the present impact of self-experienced AIE; difference scores for the change in impact (sum score past impact minus sum score present impact) of self-experienced AIE; the oldest age at which a self-experienced AIE was reported for each participant; the youngest age at which a self-experienced AIE was reported for each participant; a missingness indicator variable for the age at which self-experienced LEC-5 events were reported; a missingness indicator variable for the past impact of self-experienced LEC-5 events; a categorical variable for the presence of self-experienced childhood AIE; average scores for the past and present impact of self-experienced AIE; average scores for the past and present impact of witnessed AIE; average scores for each of the SCIM domains, average scores for each of the Brief-COPE domains; sum scores for each of the Brief-COPE domains.

Before the analysis, the Excel file of the final dataset was transformed into an SPSS file to avoid problems in R Studio that occurred when the Excel file was used.

LEC-5

Two participants (IDs 201, 221) reported the age for a LEC-5 event but not the impact ratings. Since age was dichotomized for hypothesis 2 and the missing data were for non-AIE events, these missing data did not influence the analyses.

One participant (ID 224) reported individual scores for multiple ages for LEC-5 events 6 and 9. The scores were averaged in Excel before the statistical analyses.

Four participants (ID 141, 201, 198, 256) reported no age for witnessed LEC-5 events. Since the analyses focused on self-experienced events, these missing data did not influence the analyses.

Two participants (ID 12, 14) did not report the age for self-experienced (and witnessed) AIE on the LEC-5. These participants were excluded from the analysis for hypothesis 2.

One participant (ID 20) did not report the age for a non-interpersonal LEC-5 event. This did not influence the analyses.

One participant (ID 37) did not provide a response for LEC-5 item 13. The event was coded as a non-occurrence.

Brief-COPE

Two participants (ID 9, 71) did not fill in one item on the Brief-COPE (item 12 and 22). The missing values were imputed with the mean of the other items in the corresponding coping subscale (problem-focused, and emotion-focused coping respectively). For participant 9, this was done in R Studio. For participant 71, this was done in Microsoft Excel. The values were assumed missing at random.

Other

Four participants were excluded because they did not complete the original study (ID 78, 84) or because their ID did not match any participant in the original study (IDs unknown). The participants without matching IDs were not due to test-runs conducted by the researchers. Three participants (ID 69, 19, 119) were excluded after completing the add-on study because they reported that their answers were not truthful.

Appendix E: Instruments

R Packages

The following packages were used in R (R Core Team, 2023): *AICcmodavg* (Mazerolle, 2023), *broom* (Robinson et al., 2023), *car* (Fox & Weisberg, 2019), *dplyr* (Wickham et al., 2023a), *faraway* (Faraway, 2022), *finalfit* (Harrison et al., 2023), *foreign* (R Core Team, 2022), *Ggally* (Schloerke et al., 2021), *ggm* (Marchetti et al., 2020), *ggplot2* (Wickham, 2016), *ggpubr* (Kassambara, 2023), *gridExtra* (Auguie, 2017), *haven* (Wickham et al., 2023b), *Hmisc* (Harrell, 2023), *lmtest* (Zeileis & Hothorn, 2002), *mediation* (Tingley et al., 2014), *memisc* (Elff, 2023), *moments* (Komsta & Novomestky, 2022), *plotly* (Sievert, 2020), *pwr* (Champely, 2020), *psych* (Revelle, 2023), *readr* (Wickham et al., 2023c), *readxl* (Wickham 2023d), and *tidyverse* (Wickham et al., 2019).

Life Experiences Checklist-5 (LEC-5) Adapted

Instructions: Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; c) or both. Furthermore, please specify at which age(s) you had this experience yourself/ were witness to it. If you do not know the exact age anymore, try to give an estimate. Also, please indicate how the event affected you in the past and whether it still has impact on your life today. Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

Figure E-1

First Page of the LEC-5

	Did this happen to you?		Were you a witness to?		Self			Witness		
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
2. Fire or explosion	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
4. Serious accident at work, home, or during recreational activity	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
9. Other unwanted or uncomfortable sexual experience	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
10. Combat or exposure to a war-zone (in the military or as a civilian)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5

Figure E-2

Second Page of the LEC-5

	Did this happen to you?		Were you a witness to?		Self			Witness		
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
12. Life-threatening illness or injury	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
13. Severe human suffering	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
14. Sudden violent death (for example, homicide, suicide)	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
15. Sudden accidental death	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
16. Serious injury, harm, or death you caused to someone else	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5
17. Any other very stressful event or experience, namely _____	Yes	No	Yes	No	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5	Age(s)	Impact Past 1 2 3 4 5	Impact Now 1 2 3 4 5

Curious Experience Survey (CES) Items

Instruction: In the following you will receive 31 statements about experiences that you may encounter in your daily life. Please indicate the frequency (never, occasionally, sometimes, frequently, almost always) with which you experience these events (when you are not under the influence of alcohol or drugs).

1. Drove or rode somewhere without remembering later what happened during all or part of the trip.
2. Was listening to someone talk and suddenly realized I did not hear part or all of what was said.
3. Found myself in a place and had no idea how I had gotten there.
4. Found myself dressed in clothes I didn't remember putting on.
5. Found new things among my belongings that I didn't remember buying.
6. Was approached by someone I didn't know who called me by another name or who insisted that he or she had met me before.
7. Had the experience of feeling as though I was standing next to myself, or watching myself as if I were looking at a different person.
8. Was told that I sometimes do not recognize a friend or family member.
9. Found that I had no memory for some important event in my life (for example, a wedding or graduation).
10. Had the experience of being accused of lying when I did not think I had lied.
11. Had the experience of looking in a mirror and not recognizing myself.
12. Had the experience of feeling that other people, objects, and the world around me were not real.
13. Had the experience of feeling that my body did not belong to me.
14. Had the experience of remembering a past event so vividly that it felt like I was reliving that event.
15. Had the experience of not being sure whether things I remember happening really did happen or whether I just dreamed them.
16. Had the experience of being in a familiar place but finding it strange and unfamiliar.
17. Found that when I was watching television or a movie I became so absorbed in the story that I was unaware of other events happening around me.
18. Found that I became so involved in a fantasy or daydream that it felt like it was really happening to me.
19. Found that I was able to ignore pain.

20. Find that I sometimes sit staring off in space, thinking of nothing, and am not aware of the passage of time.
21. Talked out loud to myself.
22. Find that in one situation I act so differently from when I'm in another situation that I feel almost as if I were two different people.
23. Find that in certain situations I am able to do things with amazing ease and spontaneity that would usually be difficult for me.
24. Found that I could not remember whether I had done something or had just thought about doing that thing.
25. Found evidence that I had done things that I did not remember doing.
26. Found writings, drawings, or notes among my belongings that I must have done but cannot remember doing.
27. Found that I hear voices inside my head that told me to do things or that commented on things that I was doing.
28. Felt as though I was looking at the world through a fog so that people or objects appeared far away or unclear.
29. Felt like I was dreaming when I was awake.
30. Felt like I was disconnected from my body.
31. Felt that I could not move my hands or feet.

Self-Concept and Identity Measure (SCIM) Items

The questionnaire was introduced with the statement: “In the following you will receive 27 statements about yourself. Please indicate the degree to which you agree or disagree with the statement.“

1. I know what I believe or value.
2. When someone describes me, I know if they are right or wrong.
3. When I look at my childhood pictures I feel like there is a thread connecting my past to now.
4. Sometimes I pick another person and try to be just like them, even when I’m alone.
5. I know who I am.
6. I change a lot depending on the situation.
7. I have never really known what I believe or value.
8. I feel like a puzzle and the pieces don’t fit together.
9. I am good.
10. I imitate other people instead of being myself.
11. I have been interested in the same types of things for a long time.
12. I am so different with different people that I’m not sure which is the “real me.”
13. I am broken.
14. When I remember my childhood I feel connected to my younger self.
15. I feel lost when I think about who I am.
16. At least one person sees me for who I really am.
17. I always have a good sense about what is important to me.
18. I am so similar to certain people that sometimes I feel like we are the same person.
19. I am basically the same person that I’ve always been.
20. I feel empty inside, like a person without a soul.
21. My opinions can shift quickly from one extreme to another.
22. I no longer know who I am.
23. I am more capable when I am with others than when I am by myself.
24. No one knows who I really am.
25. I try to act the same as the people I’m with (interests, music, dress) and I change that all the time.
26. I am only complete when I am with other people.

27. The things that are most important to me change pretty often.

Brief-COPE Items

The questionnaire was introduced on Qualtrics with the statement: „The following questions ask how you have sought to cope with a hardship in your life. Read the statements and indicate how much you have been using each coping style.“

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself “this isn't real.”
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I’ve been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I’ve been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I’ve been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I’ve been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.