The Role of Self-Concept Clarity in Linking Childhood Maltreatment to Dissociation: Evidence from an Interpersonal Eye-Gazing Task

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Abstract

Childhood maltreatment has been linked to dissociative symptoms, yet the pathways underlying this relationship remain understudied. Drawing on developmental models, this study tested whether self-concept clarity (SCC) mediates the relationship between early adversity and state dissociation elicited by sustained interpersonal gaze. We hypothesized that greater maltreatment severity would predict lower SCC, which in turn would predict larger pre-post increases in dissociative symptoms during a ten-minute, low-illumination eye-gazing induction. A sample of 151 healthy undergraduates (aged 17-31) completed questionnaires assessing childhood maltreatment, SCC, state dissociation (pre- and post-induction), perceptual distortion, and trait dissociation. Results showed that maltreatment severity was negatively associated with SCC and that lower SCC predicted greater increases in state dissociation change. Mediation analysis using 4,988 bootstrap samples confirmed a significant indirect-only effect of maltreatment on change in state dissociation via SCC, with no direct effect of maltreatment on dissociation. The gaze induction produced a large mean increase in dissociative symptoms and perceptual distortion scores were moderately high. These findings support an identity-centered framework in which SCC operates as a full mediator linking childhood maltreatment to situational dissociation. By identifying SCC as a malleable target, this work suggests promising avenues for interventions aimed at reducing dissociative vulnerability in trauma-exposed individuals.

Keywords: childhood maltreatment, self-concept clarity, state dissociation, eye-gazing induction, mediation analysis

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Importance and Scope

Childhood maltreatment is a pervasive global issue, with an estimated one in four children experiencing some form of abuse or neglect (Brown et al., 2023; Lippard & Nemeroff, 2019). These adverse experiences have profound and lasting consequences, disrupting psychological development and increasing vulnerability to mental health disorders. Among the most critical yet underexplored consequences of childhood maltreatment are dissociation and self-concept clarity (SCC) – two constructs that play a central role in understanding the impact of childhood maltreatment on emotional regulation and identity formation. This thesis examines the role of SCC as a developmental mediator explaining why childhood maltreatment leads to dissociative responses, particularly under interpersonal stress.

Defining Childhood Maltreatment

Childhood maltreatment encompasses a range of adverse experiences that occur before the age of 18 (World Health Organization, 2024). These include physical, emotional or psychological abuse, sexual abuse, and neglect (Institute of Medicine & National Research Council, 2014). Physical abuse involves deliberate harm to a child, such as hitting, kicking, or burning, while emotional or psychological abuse includes behaviors that damage a child's self-esteem or emotional well-being, such as rejection, threats, or constant criticism. Sexual abuse refers to compelling or coercing a child into sexually explicit acts, including molestation, rape, or exploitation. Finally, neglect is characterized by a caregiver's failure to meet a child's basic needs, such as food, safety, or medical care (Institute of Medicine & National Research Council, 2014).

The psychological consequences of childhood maltreatment are severe and enduring, often impairing emotional regulation, social functioning, and interpersonal relationships. A recent meta-analysis of 53 studies (N = 13,635) found small negative associations between childhood maltreatment and global functioning as well as interpersonal relationships, alongside a small positive association between childhood maltreatment and aggressive behavior (Fares-Otero et al., 2023). Survivors of childhood maltreatment are also at increased risk for various mental health disorders, including anxiety, depression, post-traumatic stress disorder (PTSD), and dissociative disorders (Cicchetti et al., 2015; Institute of Medicine & National Research Council, 2014).

Dissociation: Mechanisms and Psychological Impact

Dissociation is defined as a disruption in the normal integration of consciousness, memory, identity, and perception (Spiegel et al., 2013). It can manifest as state dissociation, a temporary disruption in consciousness often triggered by acute stressors (Krause-Utz et al., 2017), or as trait dissociation, which reflects a tendency to experience dissociative states frequently and persistently (Salmon et al., 2023).

Steinberg's Five Component Model of Dissociation (1995) provides a comprehensive framework for understanding dissociation, identifying five distinct forms: depersonalization (DP), derealization (DR), dissociative amnesia, identity confusion, and identity alteration. Among maltreated youth, DP and DR are the most common symptoms (Choi et al., 2017). DP involves persistent or recurrent experiences of feeling detached from oneself, as if observing one's mental processes or body from the outside (Center for Substance Abuse Treatment, 2014). DR is characterized by a persistent sense of unreality regarding one's surroundings, with the world appearing dreamlike or distorted (Center for Substance Abuse Treatment, 2014).

Persistent symptoms of DP and DR characterize the dissociative subtype of PTSD (Boyer et al., 2022), affecting approximately 22-48% of individuals with PTSD (see a recent meta-analysis of 49 studies involving $N = 8,214$ participants; White et al., 2022). Although it has been suggested that state dissociation may initially serve as a protective mechanism by allowing individuals to emotionally distance themselves from distressing experiences (Mateescu, 2025), chronic reliance on dissociation (trait dissociation) has been discussed as a potential risk factor for the development of maladaptive patterns that impair psychological functioning, as highlighted in recent reviews (Boyer et al., 2022; Krause-Utz et al., 2017; Lanius et al., 2018).

Childhood Maltreatment as a Precursor to Dissociation

A meta-analysis (Vonderlin et al., 2018) synthesized findings from 65 studies ($N = 7,352$), revealing a moderate-to-large effect size linking childhood maltreatment to dissociative tendencies. Victims of sexual and physical abuse reported the highest trait dissociation scores, with earlier trauma onset, prolonged exposure, and parental involvement emerging as key predictors. These findings emphasize the importance of developmental timing and relational dynamics in shaping dissociative outcomes.

The cumulative impact of multiple types of maltreatment is also critical. Individuals exposed to multiple forms of childhood maltreatment – such as a combination of sexual abuse, physical abuse, and neglect – face a significantly higher risk of persistent dissociative symptoms into adulthood (Schalinski et al., 2016). Supporting this, a latent profile analysis by Daniels et al. (2024) ($N = 3,128$) identified six subgroups of individuals characterized by distinct constellations of dissociative symptoms. The most severe class – characterized by extreme dissociation – was closely associated with the highest levels of both childhood abuse and neglect. These findings reinforce the idea that trauma severity and multiplicity contribute to dissociative symptomatology.

While the link between childhood maltreatment and dissociation is well-established, not all individuals exposed to childhood maltreatment develop dissociative symptoms to the same extent (Daniels et al., 2024). This variability suggests the influence of underlying mechanisms that shape individual trauma responses, one of which may be self-concept clarity (SCC).

Self-Concept Clarity: Development and Role of Maltreatment

Beyond its impact on dissociation, childhood maltreatment has been found to disrupt the development of a stable and cohesive self-concept (Cicchetti & Doyle, 2016). Attachment theory posits that early relational experiences are fundamental to identity formation and emotional regulation, with secure attachment bonds providing the foundation for self-coherence and stability (Bowlby, 1988). When these bonds are disrupted by neglect, abuse, or instability, individuals may struggle to develop a clear and consistent self-concept, increasing their vulnerability to identity fragmentation and psychological distress (Cicchetti & Doyle, 2016).

Self-concept clarity (SCC) refers to the extent to which individuals have a clear, stable, and internally consistent understanding of their self-beliefs (Campbell et al., 1996). High SCC is associated with greater psychological resilience, emotional stability, and coherent self-perception over time. In contrast, low SCC is associated with identity confusion, self-doubt, and emotional instability, increasing susceptibility not only to general psychological distress (DeMarree & Bobrowski, 2017), but also to dissociative symptoms such as DP and DR (Lassri et al., 2022).

A recent meta-analysis (Melamed et al., 2024) of 134 studies (N = 255,334) found that childhood maltreatment was significantly associated with lower SCC in children and adolescents (small effect size), highlighting the early and lasting impact of maltreatment on self-concept development. While not all individuals with childhood adversity experience

identity-related difficulties, research suggests that cumulative exposure to maltreatment may increase the likelihood of long-term disruptions in identity development, leading some individuals to carry an unclear or unstable sense of self into adulthood (Hayward et al., 2020).

Integrating Childhood Maltreatment, Dissociation, and SCC

Emerging research suggests that SCC and dissociation may exist on opposite ends of a continuum of self-concept integration (Evans et al., 2015). While SCC reflects stability and self-continuity across different roles and situations (Campbell et al., 1996), dissociation is associated with fragmented and inconsistent self-views, particularly in trauma-exposed individuals (Evans et al., 2015). Supporting this continuum, Daniels et al. (2024) identified six dissociative symptom clusters in a large sample (N = 3,128), with the most severe cluster marked by pronounced identity confusion – a construct closely related to low SCC – alongside elevated DP and DR symptoms. Individuals with low SCC may struggle to integrate self-aspects coherently, leading to increased compartmentalization and dissociative tendencies, especially under stress (Chiu et al., 2017; Evans et al., 2015). Consequently, disrupted SCC may directly contribute to reliance on dissociative coping mechanisms (Chiu et al., 2017; Lassri et al., 2022), shaping how trauma-exposed individuals process emotionally or socially demanding experiences (Evans et al., 2015).

The Developmental Role of SCC in the Childhood Maltreatment-Dissociation Link

From a developmental perspective, SCC may serve as a critical mechanism explaining how childhood maltreatment leads to dissociation. Extensive evidence demonstrates that childhood maltreatment disrupts the formation of a stable self-concept (Melamed et al., 2024), likely due to impairments in early attachment relationships (Bowlby, 1988; Cicchetti & Doyle, 2016). The Betrayal Trauma Theory (Freyd, 1996) provides a framework for understanding these dynamics, suggesting that when a child experiences abuse perpetrated by a trusted caregiver, dissociation serves as a protective mechanism to suppress awareness of

the betrayal. While this adaptation preserves the attachment bond necessary for survival, it comes at the cost of identity coherence. Over time, this process fragments the self, leading to persistent reductions in SCC and increasing susceptibility to dissociation.

Taken together, these findings support the conceptualization of SCC as a developmental mediator through which childhood maltreatment exerts its long-term effects on dissociative symptoms. Although some studies have conceptualized SCC as a moderator, the current study adopts a mediation framework. For instance, Lassri et al. (2022) conducted a study with 65 high-functioning young females (M_{age} = 25.59, SD_{age} = 3.89), examining whether SCC moderates the relationship between childhood sexual abuse (CSA) and dissociation. They found that CSA predicted higher levels of DP/DR only among individuals with low SCC (large effect size), suggesting that high SCC may serve as a protective buffer against dissociative symptoms. However, the current study views SCC not as a fixed moderating trait but as a developmental consequence shaped over time by early relational experiences such as maltreatment (Bowlby, 1982; Cicchetti & Doyle, 2016). From this perspective, childhood maltreatment impairs SCC development, which subsequently increases susceptibility to dissociative states.

This mediation model aligns closely with previous research identifying SCC as a mediator between childhood maltreatment and various trauma-related outcomes, including depression, anxiety, loneliness, psychosis (Evans et al., 2015; Wong et al., 2018), and related constructs such as attachment insecurity mediating the link between childhood maltreatment and paranoia (Mertens et al., 2021). These studies collectively highlight SCC's critical developmental role, emphasizing how a disrupted self-concept resulting from maltreatment indirectly contributes to adult psychopathology (Cicero, 2017).

Study Rationale: The Interpersonal Eye-Gazing Task

Social and evaluative situations, such as interpersonal interactions, direct eye contact, and high-stress environments, have been conceptualized as potential triggers for dissociative states in survivors of childhood maltreatment (Boyer et al., 2022). This heightened vulnerability is often rooted in early attachment disruptions, which impair emotional regulation and increase sensitivity to subtle social cues, including facial expressions and eye gaze. As a result, everyday social interactions may feel overwhelming or threatening, increasing the likelihood of dissociative responses (Mertens et al., 2021).

Building on this foundation, the present study employs interpersonal gaze as a trigger. Unlike trauma reminders that rely on autobiographical recall (e.g., Berntsen & Rubin, 2013) or non-interpersonal tasks such as mirror-gazing (e.g., Ainley et al., 2012), interpersonal gaze uniquely engages self-referential and social-cognitive processes central to real-world social interactions, naturally increasing self-awareness (Cañigueral & de C. Hamilton, 2019; Conty et al., 2016; Schilbach, 2015). According to the Watching Eyes Model, being observed through direct gaze intensifies self-focused attention (Baltazar et al., 2014; Cañigueral & de C. Hamilton, 2019), which may be particularly distressing for individuals with impaired SCC, exacerbating self-doubt, identity fragmentation, and social anxiety (Lassri et al., 2022). For trauma survivors with low SCC, the heightened self-awareness elicited by interpersonal gaze may increase susceptibility to dissociative states (Campbell et al., 1996).

Furthermore, experimental research has shown that prolonged interpersonal eye contact under low illumination can elicit dissociative symptoms – such as DP, DR, and identity disturbances – as well as visual distortions (Caputo, 2015, 2019). Caputo (2019) found that different categories of strange-face illusions experienced during interpersonal eye-gazing were associated with specific dissociative domains, suggesting that these perceptual phenomena may reflect disruptions in self-referential processing. Caputo (2015) similarly interpreted such effects as potentially involving mechanisms like sensory deprivation or the

projection of unconscious content onto the other's face. Although trauma history was not assessed in these studies, Caputo (2017) hypothesized that individual differences – such as personality traits or aspects of self-structure – may influence susceptibility to these experiences. Taken together, these findings highlight the utility of interpersonal gaze paradigms as ecologically valid tools for exploring how self-related processes, such as SCC, shape dissociative responses in interpersonal contexts.

Purpose and Contributions of the Study

This study investigates whether SCC mediates the relationship between childhood maltreatment severity and state dissociation severity in response to an interpersonal eye-gazing task. By focusing on dissociation in a social context, this research extends previous work beyond trauma recall methods and provides insight into how early relational trauma may contribute to dissociative responses in social interactions through disruptions in SCC.

Research Question and Hypothesis

To guide this investigation, this study explores the following research question: Does SCC mediate the relationship between childhood maltreatment severity and increased state dissociation elicited by interpersonal gaze? It is hypothesized that greater childhood maltreatment severity will predict lower SCC, which, in turn, will be associated with a greater increase in dissociative symptoms following the interpersonal gaze task.

Methods

Research Design

This study was part of a larger research project investigating multiple psychological variables. While this thesis primarily focuses on childhood maltreatment, state dissociation, and self-concept clarity (SCC), additional measures of trait dissociation and perceptual distortions experienced during the task were included to better characterize the sample and facilitate comparisons with previous research. The study employed a pre-post design with a single group, in which all participants completed the same questionnaire battery and underwent the same dissociation-induction procedure. This design was chosen to effectively capture changes in dissociative symptoms and assess potential mediation effects of SCC.

Participants

Participants were recruited through the research participation platform for first-year psychology students enrolled in the Bachelor's in Psychology program. Eligibility criteria included providing written informed consent upon arrival at the laboratory and availability for the full duration of the experimental session. In exchange for participation, students received course credits as compensation.

The sample initially consisted of 154 participants, but three were excluded: one due to missing data from technical issues (participant 50) and two due to excessive noise during the induction procedure (participants 38 and 39). The final sample included 151 participants with a mean age of 19.70 years (*SD* = 2.10, range: 17-31). The majority identified as female (*n* = 116, 76.8%), followed by male (*n* = 32, 21.2%), and non-binary (*n* = 3, 2.0%). Participants came from diverse national backgrounds, with 23.8% (*n* = 36) identifying as German, 8.0% (*n* = 12) as Dutch, and 6.6% (*n* = 10) as Romanian. Additionally, 9.9% (*n* = 15) identified as mixed nationality, while 51.7% (*n* = 78) belonged to other nationalities.

Materials

The study focused on three primary psychological variables: childhood maltreatment, state dissociation, and SCC. Consistent with APA test-security guidelines (APA, 2017), full item content is omitted in the public version of this thesis (see Appendix A).

Childhood Maltreatment

Childhood maltreatment severity was assessed using the Childhood Trauma Questionnaire – Short Form (CTQ-SF; Bernstein & Fink, 1996). This 28-item self-report measure evaluated experiences of maltreatment across five subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Participants rated each item on a 5-point Likert scale ranging from 1 [*never true*] to 5 [*very often true*]. An example item is: "People in my family said hurtful or insulting things to me" (item 14). Scoring involves reverse-coding specific items (items 2, 5, 7, 13, 19, 26, 28) and calculating the sum of scores for each subscale, yielding subscale scores ranging from 5 to 25. The total CTQ score, reflecting overall trauma exposure, ranges from 25 to 125, with higher scores indicating greater levels of childhood maltreatment. Three additional items (items 10, 16, 22) form the Minimization/Denial validity scale, which was excluded from the analysis. The CTQ-SF is a widely used screening tool with substantial to excellent internal consistency (α = .80 - .89) as well as strong support for convergent validity (Hagborg et al., 2022). In the present sample, the CTQ-SF demonstrated excellent internal consistency (α = .91).

State Dissociation

State dissociation was assessed using the Responses to Script-Driven Imagery Scale (RSDI; Hopper et al., 2007), a self-report measure designed to evaluate state-level PTSD and dissociative symptoms in response to trauma-related script-driven imagery tasks. The scale consists of 18 items divided into three subscales: reexperiencing, avoidance, and dissociative symptoms. For this study, only the dissociative symptoms subscale (6 items) was utilized, administered both before and after the eye-gazing session. Participants rated each item on a

slider scale ranging from 1 [*not at all*] to 6 [*a great deal*], reflecting the extent to which they experienced the described situations in the last 10 minutes (before and during the eye-gazing task). An example item is: “Did it feel like you were unreal?”. Subscale scores are calculated as the sum of the six items, with higher scores indicating greater dissociative symptom severity. The RSDI is a validated tool with high internal consistency and robust convergent and discriminant validity, making it a reliable measure for assessing dissociative states and related symptoms (Hopper et al., 2007). In the present sample, the dissociative symptoms subscale showed high internal consistency before (α = .88) αnd after (α = .86) the eye-gazing task.

To assess changes in state dissociation, a change score (post-task minus pre-task dissociation) was computed, with positive values indicating an increase in dissociative symptoms following the eye-gazing task. This change score was used as the primary dependent variable in the analyses.

Self-Concept Clarity

The extent of self-concept clarity (SCC) was measured using the Self-Concept Clarity Scale (SCCS; Campbell et al., 1996), a 12-item self-report questionnaire assessing the extent to which self-beliefs are clearly and confidently defined, internally consistent, and stable. Participants rated each item on a 5-point Likert scale ranging from 1 [*strongly disagree*] to 5 [*strongly agree*]. An example item is: “In general, I have a clear sense of who I am and what I am” (item 11). Scoring involves reverse-coding specific items (1, 2, 3, 4, 5, 7, 8, 9, 10, 12) before calculating the mean scale score. Higher scores indicate greater SCC. The SCCS demonstrates high itnernal consistency (α = .86), strong temporal stability as evidenced by test-retest correlations (Campbell et al., 1996), and high concurrent validity (Crocetti et al., 2015). In the current sample, the SCCS showed good internal consistency (α = .85).

Trait Dissociation

Trait dissociation severity was assessed using the Dissociative Experiences Scale (DES-II; Carlson & Putnam, 1993), a widely used self-report measure designed to evaluate the frequency of dissociative experiences in daily life. The DES-II consists of 28 items, each describing a dissociative phenomenon, which participants rated by indicating the percentage of time they experience each on a continuous scale ranging from 0% [*never*] to 100% [*always*]. An example item is: "Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves do something as if they were looking at another person" (item 7). The total DES-II score is calculated as the mean of all item scores, with higher scores indicating greater dissociative tendencies. The DES-II is the most commonly used measure of dissociation and has demonstrated strong convergent, discriminant, and criterion validity (Arzoumanian et al., 2023; Calrson & Putnam, 1993) and excellent internal consistency (α = .95; Saggino et al., 2020). In the present sample, the scale also showed excellent internal consistency (α = .93).

Perceptual Distortions

Perceptual distortions experienced during the eye-gazing task were assessed using the Strange-Face Questionnaire-Revised (SFQ-R; Caputo, 2023), a 34-item self-report measure designed to evaluate anomalous visual and identity-related experiences occurring during mirror or interpersonal eye-gazing. The SFQ-R comprises three subdimensions: (1) Facial Deformations, assessing changes in facial features or the overall appearance of the face; (2) Bodily Face Detachment, capturing dissociative experiences involving a perceived disconnection between the face and body, including sensations of observing oneself from an external perspective; and (3) Dissociated Identity, evaluating the perception of unfamiliar or shifting identities in one's own or another person's face. Participants rated 33 items describing anomalous experiences and one control item (item 19) on a 5-point Likert scale ranging from 0 [*no, never*] to 4 [*very often*], based on their experiences during the task. An

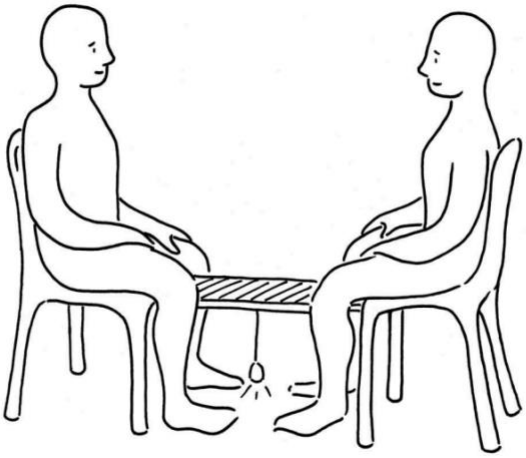
example item is: “Did you see a cartoon-like face?” (item 28). The total SFQ-R score is computed by summing all item scores excluding item 19, which serves as a control item not directly related to anomalous face perception (e.g., “Did you see a tree or a mountain?”). This item functions as an attention check to identify inattentive or indiscriminative responding. As such, the total score reflects the frequency of 33 core anomalous perceptual experiences, yielding a range of 0-132, with higher scores indicating greater perceptual distortions and dissociative anomalies. The SFQ-R has demonstrated good internal consistency ($\alpha = .83$) and strong construct validity (Caputo, 2023). In the current sample, the SFQ-R demonstrated good internal consistency ($\alpha = .88$).

Laboratory Setup

The study involved a controlled laboratory environment. The setup included two private desks, each equipped with a computer for participants to complete Qualtrics-based questionnaires. In the second section of the lab, two chairs were positioned opposite each other, connected by a wooden plank with a small light underneath set at 0.8 lux, as shown in Figure 1. A light measurement device ensured consistent illumination, and a cellphone functioned as a timer.

Figure 1

Physical Setup for the Eye-to-Eye Gazing Task



Note. From "Strange-face illusions during eye-to-eye gazing in dyads: Specific effects on derealization, depersonalization and dissociative identity," by G. Caputo, 2019, *Journal of Trauma & Dissociation, 20*(4), 420–444. Drawing by A. Conte. https://doi.org/10.1080/15299732.2019.1597807

Procedure

Participants signed up via the SONA system for available time slots set by the researchers. The experiment took place in the basement laboratory of the Heymans building, which had no windows and was divided into two sections by a room divider.

Upon arrival, participants were welcomed and provided with a verbal briefing (see Appendix B) outlining their right to withdraw participation at any moment, the sensitive nature of the study, and an overview of the procedure. After addressing any questions, participants digitally signed the informed consent form (see Appendix C) before proceeding with the first phase of the study.

In the first section of the lab, participants completed the first set of Qualtrics-based questionnaires at private desks, ensuing they sat across from each other without direct

visibility. The questionnaire battery began with sociodemographic questions (e.g., age, gender, nationality). To ensure data integrity in case of technical disruptions, participants provided identification markers (e.g., initials of parents' names), which were used solely for session-linking purposes. The battery continued with baseline assessments related to emotional regulation and schema modes, as well as measures for the Responses to Script-Driven Imagery Scale (RSDI), administered at this stage to establish a pre-induction baseline of dissociation levels.

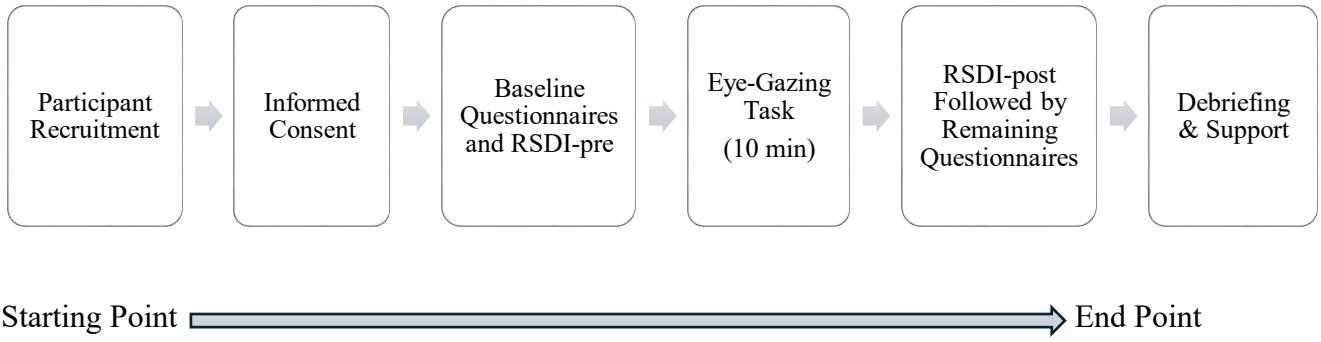
After completing the initial assessments, participants proceeded to the eye-gazing task, a dissociation induction procedure designed to elicit state dissociation through prolonged interpersonal gaze exposure. Seated across from each other on chairs connected by a wooden plank, they maintained uninterrupted eye contact for 10 minutes in a dimly lit setting (0.8 lux). The physical setup included 146.5 cm of space between participants' chairs, 165 cm between their backs and the walls, 50 cm to their left and right, and 110 cm between the participants and the assessor, who monitored the procedure. This task was designed to heighten self-awareness and interpersonal focus, creating structured conditions for eliciting dissociative experiences. Participants maintained eye contact for an average of 88.2% (SD = 22.7%) of the task, confirming that the induction delivered substantial and consistent exposure to the interpersonal stimulus.

Immediately after the eye-gazing task, participants returned to their desks and completed a second battery of Qualtrics-based questionnaires to assess changes in dissociation and other psychological constructs. The Responses to Script-Driven Imagery Scale (RSDI) was administered again, this time measuring state dissociation post-induction, allowing for the calculation of dissociative symptom change scores. Participants then completed the Self-Concept Clarity Scale (SCCS), the Childhood Trauma-Questionnaire – 28 item Short Form (CTQ-SF), and additional questions related to visual illusions (SFQ-R).

After completing the post-induction assessments, participants were invited to ask questions before leaving the laboratory. If any participant expressed distress, they were guided through a stepped debriefing process. This included relaxation techniques, coping strategies, and, if necessary, information about support services.

Figure 2

Flow Diagram of Procedure



Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics (Version 27) and JASP (Version 0.19.3), with a significance level set at $p < .05$, two-sided to determine statistical significance. SPSS was used for data cleaning, descriptive statistics, and assumption testing, while JASP was used for mediation analysis due to its built-in support for bootstrapping and structured modeling.

Prior to analysis, the dataset was reviewed for outliers for descriptive purposes. Six outliers were identified through box plots: participants 37, 56, 75, 103, 118, 137 (see Appendix D). Among these, participants 37, 56, and 118 had standardized residuals exceeding ± 3, indicating extreme values. However, these cases were retained, as elevated scores on measures such as childhood trauma (CTQ-SF) and self-concept clarity (SCCS) are

not uncommon in clinical psychology and may reflect genuine individual variation rather than measurement error.

Descriptive statistics were calculated for all demographic and key study variables. Before testing hypotheses, statistical assumptions were evaluated to ensure the validity of the results. These included linearity, homoscedasticity, normality of residuals, independence of residuals, and absence of multicollinearity. Linearity was evaluated using a scatterplot of standardized predicted values against standardized residuals (see Appendix E), confirming that the assumption was met. Homoscedasticity was assessed using residual plots and formally tested using the Breusch-Pagan test, which confirmed no violation and equal variance across levels of the independent variable (see Appendix F). Normality of residuals was examined using the Shapiro-Wilk test, Kolmogorov-Smirnov test, and visual inspection of histograms and Q-Q plots (see Appendix G). While statistical tests suggested a deviation from normality, skewness and kurtosis values were within acceptable limits, and graphical inspections showed no severe violations. Given the sample size ($N = 151$), the assumption of normality was considered met. Independence of residuals was assessed using the Durbin-Watson test, indicating no significant autocorrelation (see Appendix H). The assumption of absence of multicollinearity among independent variables was examined using Variance Inflation Factors (VIF) and Tolerance values, confirming that multicollinearity was not a concern (see Appendix I). All assumptions were met, and the data were deemed appropriate for further analysis.

To confirm the effectiveness of the dissociation induction, a paired samples t-test was conducted comparing pre- and post-induction state dissociation scores. Finally, a mediation analysis was conducted in JASP using bootstrapping with 4,988 resamples to generate bias-corrected 95% confidence intervals for the indirect effect. The analysis tested: (1) the direct effect of childhood maltreatment severity on SCC, (2) the direct effect of SCC on state

dissociation change, and (3) the indirect effect of childhood maltreatment on state dissociation change through SCC.

Ethical Considerations

This study was approved by the Ethical Committee of Psychology (ECP) of the University of Groningen (RUG) and adheres to the Ethical Principles of Psychologists and Code of Conduct outlined by the American Psychological Association (APA, 1992). The research was conducted in accordance with the principles of voluntary participation, informed consent, confidentiality, and participant well-being.

This study's design aimed to balance scientific advancement with ethical responsibility, ensuring that the research contributes valuable insights while prioritizing participant safety and psychological well-being.

Results

Table 1 presents the descriptive statistics for the study variables, including childhood maltreatment, dissociation (state and trait), self-concept clarity, and perceptual distortions.

Table 1

Descriptive Statistics of Study Variables

Variable	*n*	*M*	*SD*	Minimum	Maximum
Childhood Maltreatment	151	38.87	11.92	25.00	80.00
(State) Dissociation Change	151	9.19	6.86	-6.00	22.00
Self-Concept Clarity	151	2.90	0.77	1.25	4.83
Trait Dissociation	151	26.22	14.72	2.14	75.71
Perceptual Distortions	151	69.80	17.44	35.00	112.00

The results of the paired samples t-test revealed a significant increase in state dissociation from pre- to post-induction, $t(150) = 16.45$, $p < .001$, $d = 1.34$, 95% CI [1.12, 1.56], indicating a large effect size. These findings confirm that the eye-gazing induction effectively heightened dissociative experiences, justifying the use of change in state dissociation severity as the dependent variable in subsequent analyses. Despite the overall increase, five participants (3.3%) showed no change, and nine participants (6.0%) showed a decrease in dissociation scores, indicating some individual variability in response to the induction task.

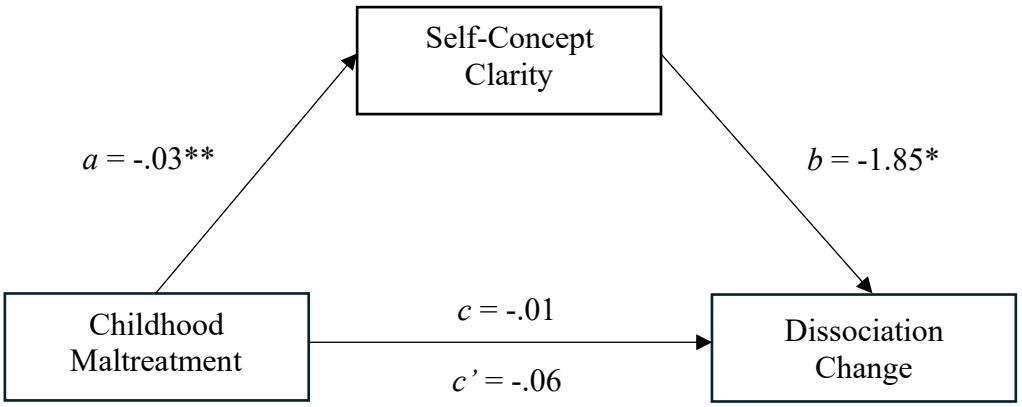
The mediation analysis examining whether SCC mediated the relationship between childhood maltreatment severity and changes in state dissociation severity revealed that the direct effect was not statistically significant, $b = -.06$, $SE = .05$, $z = -1.06$, $p = .289$, 95% CI [-.16, .05], indicating that childhood maltreatment did not directly predict changes in state

dissociation severity following the eye-gazing task. However, the indirect effect of childhood maltreatment on changes in state dissociation severity through SCC was statistically significant, $b = .05$, $SE = .02$, $z = 2.16$, $p = .030$, 95% CI [.01, .10], suggesting that greater childhood maltreatment severity was associated with lower SCC, which in turn predicted greater increase in state dissociation severity. The total effect of childhood maltreatment on changes in state dissociation severity was not significant, $b = -.01$, $SE = .05$, $z = -0.22$, $p = .828$, 95% CI [-.10, .09].

Further analysis on the path coefficients revealed that childhood maltreatment severity significantly predicted lower SCC, $b = -.03$, $SE = .01$, $z = -4.57$, $p < .001$, 95% CI [-.04, -.01], and lower SCC significantly predicted greater changes in state dissociation severity, $b = -1.85$, $SE = .73$, $z = –2.52$, $p = .012$, 95% CI [-3.31, -.44]. Together, these results support a significant indirect-only full mediation model, in which childhood maltreatment does not directly predict changes in state dissociation but exerts an influence indirectly through SCC.

Figure 3

Mediation Model Depicting the Relationships Between Study Variables



Note. Beta values are unstandardized. *a* = effect of the independent variable on the mediator. *b* = effect of the mediator on the dependent variable. *c'* = direct effect of the independent variable on the dependent variable. *c* = total effect of the independent variable on the dependent variable.

*$p < .05$. **$p < .01$.

Discussion

Summary of Main Findings

This study investigated whether self-concept clarity (SCC) mediates the relationship between childhood maltreatment and state dissociation in response to an interpersonal eye-gazing task. Results supported an indirect-only full mediation model: childhood maltreatment severity did not directly predict change in state dissociation severity, but it was significantly associated with lower SCC, which in turn predicted greater increases in dissociative symptoms. These findings suggest that vulnerability to dissociation during socially salient experiences may emerge not directly from maltreatment exposure, but through identity-related developmental mechanisms.

Path A: Is Childhood Maltreatment Associated with Lower SCC?

The significant association between childhood maltreatment and lower SCC supports previous findings suggesting that adverse early relationships disrupt the development of a coherent self-concept (Bowlby, 1988; Cicchetti & Doyle, 2016; Melamed et al., 2024).

Assuming results are valid, this link implies that early relational trauma may hinder identity integration by undermining the secure base necessary for stable self-definition. These results align with attachment theory (Bowlby, 1988) and Betrayal Trauma Theory (Freyd, 1996), both of which suggest that when early caregiving relationships are compromised, children may suppress awareness of the maltreatment to maintain attachment bonds, thereby impairing the development of self-coherence. The fact that this association was observed even in a non-clinical undergraduate sample, lends support to its developmental robustness.

Alternatively, this finding may reflect characteristics of the present sample rather than a robust developmental disruption caused by exposure to maltreatment. Participants reported relatively low maltreatment scores (CTQ-SF: $M = 38.87$, $SD = 11.92$; Bernstein & Fink, 1998). Applying the cutoff for severe-to-extreme maltreatment (CTQ total > 69; MacDonald

et al., 2016), only 4.0% (n = 6) met a clinically elevated threshold. SCC was also on the low side for a typical non-clinical population (SCCS: M = 2.90, SD = 0.77; Campbell et al., 1996), suggesting that reduced SCC may be common even when maltreatment exposure is relatively mild. In such lower-risk populations, SCC may be more sensitive to early adversity than overt or diagnosable symptoms like dissociation. Because SCC reflects a subtle, foundational aspect of psychological functioning – namely, the stability and coherence of one's self-definition – it may register the lingering effects of relational strain even in the absence of clinical psychopathology. However, this sensitivity also raises questions about specificity: the observed association might not uniquely reflect maltreatment-related disruption, but rather capture broader tendencies toward self-doubt, negative self-appraisal, or shared method variance in self-report measures. As such, the link between childhood maltreatment and SCC in this sample might indicate a latent vulnerability, but further research is needed to confirm whether this pattern reflects a true maltreatment effect or a general feature of self-related processing in non-clinical populations.

Path B: Does Low SCC Increase Dissociation During Eye Contact?

The path between SCC and change in state dissociation was also significant, suggesting that individuals with low SCC experienced greater dissociative reactivity to the interpersonal eye-gazing task. Converging evidence from both clinical and non-clinical samples shows a comparable pattern, where fragile SCC increases susceptibility to DP/DR across interpersonal contexts (Chiu et al., 2017; Evans et al., 2015; Lassri et al., 2022).

This supports the idea that dissociation is not merely a trait, but a dynamic, context-bound response shaped by self-related vulnerabilities. Prolonged direct gaze is thought to heighten self-focused attention and emotional salience, which is the core mechanism proposed by the Watching Eyes Model (Baltazar et al., 2014) and demonstrated in Caputo's strange-face studies (2015, 2019). This surge is thought to be absorbed in people with well-

integrated identities, whereas in those with less integrated selves, it might weaken the boundary between self and other, producing brief DP/DR symptoms (Campbell et al., 1996; Lassri et al., 2022). The pattern matches the continuum model of self-concept integration (Evans et al., 2015), where SCC and dissociation lie on opposite poles of identity cohesion. In this framework, individuals with high SCC are better equipped to maintain a stable sense of self under stress, while those with low SCC may experience momentary confusion or disconnection in self-perception, especially in socially salient contexts like mutual gaze.

Thus, the observed increase in DP/DR symptoms among individuals with low SCC can be understood as a situational vulnerability to altered self-awareness. This interpretation aligns with recent social-cognitive models that emphasize the fluid, context-sensitive nature of dissociative reactions (Baltazar et al., 2014; Schilbach, 2015).

Even so, the present association may reflect task-specific features that amplify perceptual salience rather than general dissociative susceptibility. For instance, the eye-gazing task may uniquely elevate self-focused attention and perceptual distortion without necessarily generalizing to other dissociative triggers. Additionally, since only DP/DR was assessed – and not full identity fragmentation – interpretations should emphasize momentary disconnection, not structural dissociation. Future work that samples multiple interpersonal stimuli and includes broader dissociative measures will clarify how far SCC-linked vulnerability extends.

Path C: Why Was There No Direct Effect of Childhood Maltreatment on Dissociation?

The absence of a direct relationship between childhood maltreatment severity and changes in state dissociation should not be interpreted as contradicting previous findings. Instead, it reinforces contemporary developmental accounts positing that early adversity undermines identity formation and, through this detour, heightens dissociative vulnerability. When SCC was entered as a mediator, maltreatment exerted its influence entirely through

lowered SCC – an "indirect-only" pattern that accords with models framing dissociation as downstream of impaired self-coherence rather than a simple function of maltreatment dosage (Cicchetti & Doyle, 2016; Evans et al., 2015). Consistent with that interpretation, models that include self-related mediators often find that maltreatment's effect on dissociation flows through constructs like SCC (Chiu et al., 2017; Cicero, 2017; Freyd, 1996). In our data, both component paths – between childhood maltreatment and SCC, and between SCC and change in state dissociation – were independently significant, corroborating the internal coherence of this mediation model. Similar SCC-mediated pathways have been documented across other outcomes, including paranoia, depression, and psychosis (Evans et al., 2015; Mertens et al., 2021; Wong et al., 2018), suggesting that identity fragmentation might be a transdiagnostic mechanism through which adversity affects later psychopathology.

While earlier meta-analyses reported moderate-to-large associations between childhood maltreatment and trait dissociation (e.g., Vonderlin et al., 2018), those studies relied on the Dissociative Experiences Scale (DES), which asks what percentage of time respondents feel dissociated. Such scores aggregate many transient state episodes and therefore yield stronger bivariate links with chronic stressors than a single laboratory-induced change score. High-risk cohorts illustrate the same issue: women with verified childhood sexual abuse (CSA) histories (Lassri et al., 2022), a sizable proportion (35%) of adults with mental health diagnoses (Daniels et al., 2024), and adult psychiatric in-patients (Schalinski et al., 2016) show robust direct effects precisely because their DES scores vary widely. By contrast, our single laboratory change score captures one situational spike, likely explaining the null direct path despite sizable trait-level findings elsewhere.

Additionally, methodological features of the present study likely dampened the direct path. The undergraduate sample of participants reported only low-to-moderate maltreatment exposure and relatively low baseline dissociation (RSDI pre-task: $M = 11.23$, $SD = 6.00$).

This restricted range, essentially a floor effect, left little variance for a bivariate association to emerge. Moreover, although the eye-gaze induction produced a robust increase in dissociation (RSDI_change: $M = 9.19$, $SD = 6.86$), participants starting at low baseline levels may not have shown clinically or statistically meaningful increases, further attenuating any direct association between childhood maltreatment and change in state dissociation.

Task-related variability likely contributed to the non-significant direct effect as well. While most participants experienced an increase in state dissociation following the task, 6.0% ($n = 9$) reported decreases and 3.3% ($n = 5$) no change. Several factors could account for this inconsistency. For some individuals, defensive disengagement strategies such as emotional numbing or cognitive distancing may have suppressed dissociative responses as a protective strategy in the face of interpersonal discomfort. Others may have experienced habituation to sustained eye contact, especially if they were already comfortable in social situations, thus reducing the induction's emotional impact.

These varied responses align with Caputo's (2015) findings, which documented a wide range of dissociative and perceptual effects during similar gaze-based paradigms. He suggested that such heterogeneity reflects unconscious projection processes, emotional resonance, and individual interpretations of ambiguous stimuli. These appraisals likely reflect deeper, often unconscious self-other dynamics, shaped by personal history and relational schemas. For instance, individuals with abuse histories may associate gaze with scrutiny or threat, potentially triggering hypervigilance or withdrawal. In contrast, those with experiences of neglect may find eye contact emotionally ambiguous or novel, sometimes leading to confusion or even positive engagement rather than detachment. These trauma subtype-specific responses may introduce additional variance in state dissociation outcomes and complicate efforts to detect consistent direct effects across heterogeneous samples.

Finally, the cross-sectional design prevents firm causal conclusions. It is possible that SCC and dissociation co-occur due to shared underlying factors rather than forming a causal chain. Unmeasured third variables such as shame (Rudy et al., 2022), emotional dysregulation (Cavicchioli et al., 2021; Paetzold & Rholes, 2021), or trait dissociation (Boyer et al., 2022) could interact with both SCC and maltreatment history to shape dissociative responses to ambiguous interpersonal situations. These factors may dilute direct effects of childhood maltreatment, especially in non-clinical populations. Longitudinal research that charts the temporal unfolding of maltreatment, SCC development, and dissociative reactivity is needed to establish developmental sequencing.

Interpreting the Strange-Face / DP-DR Pattern

Despite low average trait dissociation (DES-II: $M = 26.22$, $SD = 14.72$) – typical for non-clinical undergraduates and in line with normative data (Saggino et al., 2020) – participants nonetheless endorsed substantial strange-face illusions (SFQ-R: $M = 69.80$, $SD = 17.44$), mirroring the high endorsement and intensity reported in Caputo's gaze studies (2015, 2019), and exhibited pronounced increases in DP/DR. If valid, this pattern points to partly distinct yet overlapping mechanisms: trait dissociation reflects a general predisposition toward dissociative experiences, whereas the illusions and acute DP/DR reactions appear to be contextually triggered when self-perception is disrupted by intense interpersonal stimuli. Consistent with Caputo's (2015) perceptual model, the co-occurrence of strange-face phenomena and DP/DR likely reflects a transient breakdown in the integration of self- and other-representations rather than a chronic structural split.

More broadly, the data supports the idea that state dissociation can be elicited by social ambiguity, especially in individuals whose identities are less coherent. SCC thus emerges as a sensitive marker of vulnerability: even when baseline dissociation is low, insufficient self-clarity leaves individuals less able to tolerate the perceptual and affective

demands of sustained mutual gaze. Consequently, gaze-evoked dissociation and strange-face illusions may serve as early indicators of self-concept fragility in normative populations, not merely as signatures of entrenched dissociative pathology.

At the same time, several methodological artefacts could produce this pattern without reflecting true dissociative mechanisms. Demand characteristics and expectancy effects are unavoidable when self-report scales follow a provocative task: knowing they are taking part in an experiment, participants may re-label ordinary visual fluctuations as dissociative symptoms to inflate their scores to align with perceived study aims. Low-illumination compounds the problem by generating purely visual phenomena – after images, Troxler fading, contrast adaptation – that feel uncanny yet are not dissociative. Participants unfamiliar with these effects might interpret them as "illusions," artificially elevating SFQ-R ratings. Finally, sampling bias matters could affect results as well. Undergraduate psychology students might share traits of high suggestibility, curiosity, and a desire to conform to perceived experimental expectations, all of which can amplify self-reported anomalies on both the post-induction RSDI and the SFQ-R.

Taken together, these factors provide a non-pathological explanation for why a low trait dissociation sample could still display high strange-face scores and pronounced DP/DR surges, cautioning against over-interpreting the pattern as firm evidence of a distinct dissociative mechanism.

Strengths of the Study

The interpersonal eye-gazing task produced a large increase in state dissociation (d = 1.37), matching the potency of Caputo's mirror-fixation paradigm under dim light (Caputo, 2023). In his study, both mirror-fixation and passive "panel-staring" produced substantial depersonalization and derealization in healthy undergraduates, confirming that sustained, low-light face-fixation powerfully triggers DP/DR. By yielding a similarly large effect

through live dyadic gaze, our task shows that mutual eye contact under dim illumination is at least as effective as mirror-based procedures for eliciting state dissociation in non-clinical samples.

Like Caputo's work (2015, 2017, 2019, 2023), this study's sample consisted of healthy undergraduates with no psychiatric history, reinforcing the generalizability of dissociation induction across comparable populations. However, this study extends this line of research by embedding the gaze paradigm within a broader mediation model that incorporates both SCC and childhood maltreatment. This innovation adds conceptual depth to gaze-based research by situating dissociative responses not only in perceptual-cognitive terms but also within a developmental framework of maltreatment-related identity disruption, thereby enhancing both theoretical and clinical relevance.

Conducting the gaze task under low illumination created a realistic interpersonal trigger that captures dissociation in live social interaction, avoiding the limitations of purely introspective or memory-based methods. The pre-post design tracked within-person changes in real time, offering a dynamic, ecologically valid picture of state dissociation.

Moreover, the use of three complementary measures – state dissociation (RSDI), trait dissociation (DES-II), and task-specific perceptual distortions (SFQ-R) – provided methodological triangulation, strengthened construct validity, and enabled meaningful comparison with existing literature. Notably, the descriptive pattern of low trait dissociation, high strange-face endorsements, and a large induction effect closely mirrors Caputo's findings, underscoring the reliability of the paradigm in eliciting dissociative-like experiences, even in non-clinical samples.

The statistical approach also enhanced the robustness of findings. Mediation analyses were conducted using bias-corrected bootstrapping procedures, which improve the accuracy of indirect effect estimates. By embedding SCC in a developmental mediation model, this

study contributes to a broader shift in trauma research – from symptom-based to identity-centered frameworks – which may have greater clinical utility and theoretical coherence (Hyland et al., 2023; Kira, 2019).

Limitations and Future Directions

Despite its strengths, several limitations should be acknowledged. First, while the sample size ($N = 151$) was sufficient for detecting indirect effects, it fell short of the intended $N = 220$ threshold identified through Monte Carlo simulations. This limitation may have reduced the statistical power to detect smaller direct effects of childhood maltreatment on dissociation. Moreover, the sample consisted exclusively of first-year psychology students, which limits generalizability to more diverse or clinically affected populations. Future research should seek to replicate these findings in samples with greater trauma severity or diagnostic variability.

Second, the use of self-report instruments introduces the risk of shared method variance and introspective inaccuracy, particularly in relation to rapidly shifting dissociative states. Although the RSDI captures momentary symptoms, it may still be influenced by participant expectations, social desirability, or difficulties in accessing internal experience. Future studies would benefit from integrating clinician-rated assessments or multimodal physiological measures such as galvanic skin response, heart rate variability, pupil dilation, or eye-tracking technology, to strengthen the validity of state dissociation assessments.

Third, the study relied on a composite score of childhood maltreatment, limiting the ability to distinguish between different trauma subtypes (e.g., abuse vs. neglect). This is an important limitation, as different trauma subtypes may elicit distinct cognitive, emotional, and relational consequences, as mentioned previously. Future research should disaggregate these trauma profiles to examine how specific types of adversity shape dissociative responses through mechanisms like SCC. Incorporating qualitative interviews or narrative tasks could

also provide richer insight into how maltreatment survivors interpret interpersonal gaze and social evaluation. Additionally, the use of eye-tracking may reveal attentional biases and moment-to-moment changes in engagement or avoidance, especially among those with distinct maltreatment backgrounds.

Fourth, although dissociation was modeled as a pre-post change score, the mediation framework itself remains cross-sectional with respect to childhood maltreatment and SCC. This temporal limitation precludes definitive causal conclusions. Longitudinal designs are necessary to trace whether early relational adversity undermines SCC development over time, thereby increasing vulnerability to dissociation in adulthood – particularly under interpersonal stress.

Looking ahead, future studies could also explore SCC as a moderator rather than solely as a mediator. In particular, its interaction with individual difference variables such as shame-proneness (Rudy et al., 2022), alexithymia (Reyno et al., 2020), and hypervigilance (Bernstein et al., 2015) may help clarify why only some trauma survivors dissociate in response to social cues. Moderated mediation models could test whether these dispositional traits amplify or buffer the effects of SCC on dissociative outcomes in interpersonal contexts.

In parallel, experimental work could temporarily manipulate SCC through identity-affirming tasks to assess whether increasing SCC reduces dissociative reactivity in eye-gazing paradigms. Building on this, intervention trials might evaluate whether therapies targeting identity integration – such as schema therapy Internal Family Systems (IFS), narrative therapy, or identity-focused CBT – can reduce dissociative symptoms in trauma-exposed individuals. These approaches would not only clarify the causal role of SCC in dissociative vulnerability but also inform trauma-informed clinical interventions. By identifying SCC as a modifiable developmental factor linking childhood maltreatment to dissociation, this study offers a promising foundation for future research and therapeutic

efforts focused on strengthening identity coherence and psychological resilience in survivors of early relational adversity.

Conclusion

This study set out to examine whether self-concept clarity (SCC) mediates the relationship between childhood maltreatment and state dissociation during an interpersonal eye-gazing task. Results supported an indirect-only mediation model, indicating that childhood trauma exerts its influence on dissociative vulnerability not through direct effects, but through developmental disruptions in identity structure. Specifically, individuals with lower SCC – often shaped by early adverse experiences – were more likely to experience heightened dissociation under interpersonal stress.

By situating SCC within a trauma-informed, developmental framework, the study advances a shift in psychological science from symptom-based models of dissociation toward identity-centered explanations. Rather than conceptualizing maltreatment exposure as uniformly pathogenic, the findings emphasize the developmental pathways that shape how individuals experience themselves in relation to others. The use of a validated dissociation induction task under realistic social conditions further strengthens the ecological and clinical relevance of the results.

Importantly, this study highlights SCC as a modifiable factor – one that can be targeted in therapeutic settings to reduce dissociative vulnerability and improve resilience in social contexts. These findings open promising directions for future research and clinical intervention. Disaggregating trauma subtypes, incorporating physiological measures, and evaluating identity-focused therapies will be critical steps toward deepening our understanding of how early relational adversity shapes the developing self.

Ultimately, this study contributes to a growing recognition of the self's central role in maltreatment outcomes, emphasizing that post-traumatic functioning is shaped not only by what happened to individuals, but by how those experiences shaped their sense of who they are.

References

Ainley, V., Tajadura-Jiménez, A., Fotopoulou, A., & Tsakiris, M. (2012). Looking into myself: Changes in interoceptive sensitivity during mirror self-observation. *Psychophysiology*, *49*(11), 1672–1676. https://doi.org/10.1111/j.1469-8986.2012.01468.x

American Psychological Association. (1992). *Ethical principles of psychologists and code of conduct (1992)*. American Psychological Association. https://www.apa.org/ethics/code/code-1992

American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct*. American Psychological Association. https://www.apa.org/ethics/code

Arzoumanian, M. A., Verbeck, E. G., Estrellado, J. E., Thompson, K. J., Dahlin, K., Hennrich, E. J., Stevens, J. M., & Dalenberg, C. J. (2022). Psychometrics of Three Dissociation Scales: Reliability and Validity Data on the DESR, DES-II, and DESC. *Journal Of Trauma & Dissociation*, *24*(2), 214–228. https://doi.org/10.1080/15299732.2022.2119633

Baltazar, M., Hazem, N., Vilarem, E., Beaucousin, V., Picq, J., & Conty, L. (2014). Eye contact elicits bodily self-awareness in human adults. *Cognition*, *133*(1), 120–127. https://doi.org/10.1016/j.cognition.2014.06.009

Bennett, D. C., Modrowski, C. A., Kerig, P. K., & Chaplo, S. D. (2015). Investigating the dissociative subtype of posttraumatic stress disorder in a sample of traumatized detained youth. *Psychological Trauma Theory Research Practice and Policy*, *7*(5), 465–472. https://doi.org/10.1037/tra0000057

Bernstein, D., & Fink, L. (1998). *Childhood Trauma Questionnaire* [Retrospective Self-Report Questionnaire and Manual]. San Antonio, The Psychological Corporation. https://assets-global.website-

files.com/600754479f70fb2c4d356be6/643df3efdeffabb9064fda40_Childhood%20Trauma%20Questionnaire.pdf

Bernstein, R. E., Delker, B. C., Knight, J. A., & Freyd, J. J. (2015). Hypervigilance in college students: Associations with betrayal and dissociation and psychometric properties in a Brief Hypervigilance Scale. *Psychological Trauma Theory Research Practice and Policy*, *7*(5), 448–455. https://doi.org/10.1037/tra0000070

Berntsen, D., & Rubin, D. C. (2013). Involuntary Memories and Dissociative Amnesia. *Clinical Psychological Science*, *2*(2), 174–186. https://doi.org/10.1177/2167702613496241

Bowlby, J. (1982). *Attachment and loss* (2nd ed., Vol. 1). Basic Books.

Bowlby, J. (1988). *A Secure Base. Parent-Child Attachment and Healthy Human Development.* Basic Books. https://opus4.kobv.de/opus4-Fromm/frontdoor/index/index/docId/27488

Boyer, S. M., Caplan, J. E., & Edwards, L. K. (2022). Trauma-Related Dissociation and the Dissociative Disorders: *Delaware Journal Of Public Health*, *8*(2), 78–84. https://doi.org/10.32481/djph.2022.05.010

Brown, C. L., Yilanli, M., & Rabbitt, A. L. (2023, May 29). *Child Physical Abuse and Neglect*. StatPearls - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK470337/

Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavallee, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal Of Personality And Social Psychology*, *70*(1), 141–156. https://doi.org/10.1037/0022-3514.70.1.141

Cañigueral, R., & de C. Hamilton, A. F. (2019). The Role of Eye Gaze During Natural Social Interactions in Typical and Autistic People. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.00560

Caputo, G. B. (2015). Dissociation and hallucinations in dyads engaged through interpersonal gazing. *Psychiatry Research*, *228*(3), 659–663. https://doi.org/10.1016/j.psychres.2015.04.050

Caputo, G. B. (2017). Strange-face Illusions During Interpersonal-Gazing and Personality Differences of Spirituality. *EXPLORE*, *13*(6), 379–385. https://doi.org/10.1016/j.explore.2017.04.019

Caputo, G. B. (2019). Strange-face illusions during eye-to-eye gazing in dyads: Specific effects on derealization, depersonalization and dissociative identity. *Journal Of Trauma & Dissociation*, *20*(4), 420–444. https://doi.org/10.1080/15299732.2019.1597807

Caputo, G. B. (2023). Strange-face-in-the-mirror illusions: specific effects on derealization, depersonalization, and dissociative identity. *Journal Of Trauma & Dissociation*, *24*(5), 575–608. https://doi.org/10.1080/15299732.2023.2195394

Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation: Progress in the Dissociative Disorders, 6*(1), 16-27.

Cavicchioli, M., Scalabrini, A., Northoff, G., Mucci, C., Ogliari, A., & Maffei, C. (2021). Dissociation and emotion regulation strategies: A meta-analytic review. *Journal of Psychiatric Research*, *143*, 370–387. https://doi.org/10.1016/j.jpsychires.2021.09.011

Center for Substance Abuse Treatment. (2014). *Trauma-informed care in behavioral health services: Part 3: A review of the literature* (Treatment Improvement Protocol (TIP) Series 57). Substance Abuse and Mental Health Services Administration. https://www.ncbi.nlm.nih.gov/books/NBK207201/

Chiu, C., Chang, J., & Hui, C. M. (2017). Self-concept integration and differentiation in subclinical individuals with dissociation proneness. *Self And Identity*, *16*(6), 664–683. https://doi.org/10.1080/15298868.2017.1296491

Cicchetti, D., & Doyle, C. (2016). Child maltreatment, attachment and psychopathology: mediating relations. *World Psychiatry*, *15*(2), 89–90. https://doi.org/10.1002/wps.20337

Cicchetti, D., Toth, S. L., & Lamb, M. (2015). *Handbook of child psychology and developmental science*, (Vol. 3: Socioemotional process). John Wiley & Sons.

Cicero, D. C. (2017). Self-Concept Clarity and Psychopathology. In *Springer eBooks* (pp. 219–242). https://doi.org/10.1007/978-3-319-71547-6_12

Conty, L., George, N., & Hietanen, J. K. (2016). Watching Eyes effects: When others meet the self. *Consciousness And Cognition*, *45*, 184–197. https://doi.org/10.1016/j.concog.2016.08.016

Crocetti, E., Rubini, M., Branje, S., Koot, H. M., & Meeus, W. (2015). Self-Concept Clarity in Adolescents and Parents: A Six-Wave Longitudinal and Multi-Informant Study on Development and Intergenerational Transmission. *Journal Of Personality*, *84*(5), 580–593. https://doi.org/10.1111/jopy.12181

Daniels, J. K., Timmerman, M. E., Spitzer, C., & Lampe, A. (2024). Differential constellations of dissociative symptoms and their association with childhood trauma – a latent profile analysis. *European Journal Of Psychotraumatology*, *15*(1). https://doi.org/10.1080/20008066.2024.2348345

DeMarree, K. G., Jr., & Bobrowski, M. E. (2017). Structure and Validity of Self-Concept clarity Measures. In *Self-Concept Clarity* (Chapter 1) [Book-chapter]. https://doi.org/10.1007/978-3-319-71547-6_1

Evans, G. J., Reid, G., Preston, P., Palmier-Claus, J., & Sellwood, W. (2015). Trauma and psychosis: The mediating role of self-concept clarity and dissociation. *Psychiatry Research*, *228*(3), 626–632. https://doi.org/10.1016/j.psychres.2015.04.053

Fares-Otero, N. E., Alameda, L., Pfaltz, M. C., Martinez-Aran, A., Schäfer, I., & Vieta, E. (2023). Examining associations, moderators and mediators between childhood maltreatment, social functioning, and social cognition in psychotic disorders: a systematic review and meta-analysis. *Psychological Medicine*, *53*(13), 5909–5932. https://doi.org/10.1017/s0033291723001678

Freyd, J. (1996). *Betrayal trauma: The logic of forgetting childhood abuse.* APA PsycNet. https://psycnet.apa.org/record/1996-98930-000

Hagborg, J. M., Kalin, T., & Gerdner, A. (2022). The Childhood Trauma Questionnaire—Short Form (CTQ-SF) used with adolescents – methodological report from clinical and community samples. *Journal Of Child & Adolescent Trauma*, *15*(4), 1199–1213. https://doi.org/10.1007/s40653-022-00443-8

Hayward, L. E., Vartanian, L. R., Kwok, C., & Newby, J. M. (2020). How might childhood adversity predict adult psychological distress? Applying the Identity Disruption Model to understanding depression and anxiety disorders. *Journal Of Affective Disorders*, *265*, 112–119. https://doi.org/10.1016/j.jad.2020.01.036

Hopper, J. W., Frewen, P. A., Sack, M., Lanius, R. A., & Van Der Kolk, B. A. (2007). The Responses to Script-Driven Imagery Scale (RSDI): Assessment of State Posttraumatic Symptoms for Psychobiological and Treatment Research. *Journal Of Psychopathology And Behavioral Assessment*, *29*(4), 249–268. https://doi.org/10.1007/s10862-007-9046-0

Hyland, P., Shevlin, M., & Brewin, C. R. (2023). The memory and identity theory of ICD-11 complex posttraumatic stress disorder. *Psychological Review*, *130*(4), 1044–1065. https://doi.org/10.1037/rev0000418

Institute of Medicine, I., & National Research Council, N. (2014). *New directions in child abuse and neglect research* (A. C. Petersen, J. Joseph, & M. Feit, Eds.). National Academies Press.

Kira, I. (2019). Toward an integrative theory of Self-Identity and identity stressors and traumas and their mental health dynamics. *Psychology*, *10*(04), 385–410. https://doi.org/10.4236/psych.2019.104027

Krause-Utz, A., Frost, R., Winter, D., & Elzinga, B. M. (2017). Dissociation and alterations in brain function and structure: Implications for Borderline Personality Disorder. *Current Psychiatry Reports*, *19*(1). https://doi.org/10.1007/s11920-017-0757-y

Lanius, R. A., Boyd, J. E., McKinnon, M. C., Nicholson, A. A., Frewen, P., Vermetten, E., Jetly, R., & Spiegel, D. (2018). A Review of the Neurobiological Basis of Trauma-Related Dissociation and Its Relation to Cannabinoid- and Opioid-Mediated Stress Response: a Transdiagnostic, Translational Approach. *Current Psychiatry Reports*, *20*(12). https://doi.org/10.1007/s11920-018-0983-y

Lassri, D., Bregman-Hai, N., Soffer-Dudek, N., & Shahar, G. (2022). The interplay between childhood sexual abuse, self-concept clarity, and dissociation: A Resilience-Based Perspective. *Journal of Interpersonal Violence*, *38*(3–4), 2313–2336. https://doi.org/10.1177/08862605221101182

Lippard, E. T., & Nemeroff, C. B. (2019). The Devastating Clinical Consequences of Child Abuse and Neglect: Increased Disease Vulnerability and Poor Treatment Response in Mood Disorders. *American Journal Of Psychiatry*, *177*(1), 20–36. https://doi.org/10.1176/appi.ajp.2019.19010020

MacDonald, K., Thomas, M. L., Sciolla, A. F., Schneider, B., Pappas, K., Bleijenberg, G., Bohus, M., Bekh, B., Carpenter, L., Carr, A., Dannlowski, U., Dorahy, M., Fahlke, C., Finzi-Dottan, R., Karu, T., Gerdner, A., Glaesmer, H., Grabe, H. J., Heins, M., . . . Wingenfeld, K. (2016). Minimization of Childhood Maltreatment Is Common and Consequential: Results from a Large, Multinational Sample Using the Childhood Trauma Questionnaire. *PLoS ONE*, *11*(1), e0146058. https://doi.org/10.1371/journal.pone.0146058

Mateescu, V. (2025). Dissociation: understanding the dynamics of primary and secondary capacities. *The Global Psychotherapist*, *5*(1), 49–58. https://doi.org/10.52982/lkj258

Melamed, D. M., Botting, J., Lofthouse, K., Pass, L., & Meiser-Stedman, R. (2024). The Relationship Between Negative Self-Concept, Trauma, and Maltreatment in Children and Adolescents: A Meta-Analysis. *Clinical Child and Family Psychology Review*, *27*(1), 220–234. https://doi.org/10.1007/s10567-024-00472-9

Mertens, Y. L., Racioppi, A., Sheinbaum, T., Kwapil, T., & Barrantes-Vidal, N. (2021). Dissociation and insecure attachment as mediators of the relation between childhood emotional abuse and nonclinical paranoid traits. *European Journal of Psychotraumatology*, *12*(1). https://doi.org/10.1080/20008198.2021.1888539

Paetzold, R. L., & Rholes, W. S. (2021). The Link from Child Abuse to Dissociation: The Roles of Adult Disorganized Attachment, Self-Concept Clarity, and Reflective Functioning. *Journal of Trauma & Dissociation*, *22*(5), 615–635. https://doi.org/10.1080/15299732.2020.1869654

Reyno, S. M., Simmons, M., & Kinley, J. (2020). A meta-analytic study examining the relationship between alexithymia and dissociation in psychiatric and non-clinical populations. *Research in Psychotherapy Psychopathology Process and Outcome*, *23*(1). https://doi.org/10.4081/ripppo.2020.439

Rudy, J. A., McKernan, S., Kouri, N., & D'Andrea, W. (2022). A meta-analysis of the association between shame and dissociation. *Journal of Traumatic Stress*, *35*(5), 1318–1333. https://doi.org/10.1002/jts.22854

Saggino, A., Molinengo, G., Rogier, G., Garofalo, C., Loera, B., Tommasi, M., & Velotti, P. (2020). Improving the psychometric properties of the dissociative experiences scale (DES-II): a Rasch validation study. *BMC Psychiatry*, *20*(1). https://doi.org/10.1186/s12888-019-2417-8

Salmon, A. P., Nicol, K., Kaess, M., Jovev, M., Betts, J. K., & Chanen, A. M. (2023). Associations of state or trait dissociation with severity of psychopathology in young people with borderline personality disorder. *Borderline Personality Disorder and Emotion Dysregulation*, *10*(1). https://doi.org/10.1186/s40479-023-00226-z

Schalinski, I., Teicher, M. H., Nischk, D., Hinderer, E., Müller, O., & Rockstroh, B. (2016). Type and timing of adverse childhood experiences differentially affect severity of PTSD, dissociative and depressive symptoms in adult inpatients. *BMC Psychiatry*, *16*(1). https://doi.org/10.1186/s12888-016-1004-5

Schilbach, L. (2015). Eye to eye, face to face and brain to brain: novel approaches to study the behavioral dynamics and neural mechanisms of social interactions. *Current Opinion in Behavioral Sciences*, *3*, 130–135. https://doi.org/10.1016/j.cobeha.2015.03.006

Spiegel, D., Roberto Lewis-Fernández, Ruth Lanius, Eric Vermetten, Daphne Simeon, & Matthew Friedman. (2013). Dissociative disorders in DSM-5. *Annu. Rev. Clin. Psychol.*, 299–326. https://doi.org/10.1146/annurev-clinpsy-050212-185531

Steinberg, M. (1995). *Handbook for the Assessment of Dissociation: A Clinical Guide*. https://psycnet.apa.org/record/1995-97884-000

Vonderlin, R., Kleindienst, N., Alpers, G. W., Bohus, M., Lyssenko, L., & Schmahl, C. (2018). Dissociation in victims of childhood abuse or neglect: a meta-analytic review. *Psychological Medicine*, *48*(15), 2467–2476. https://doi.org/10.1017/s0033291718000740

Wong, A. E., Dirghangi, S. R., & Hart, S. R. (2018). Self-concept clarity mediates the effects of adverse childhood experiences on adult suicide behavior, depression, loneliness, perceived stress, and life distress. *Self And Identity*, *18*(3), 247–266. https://doi.org/10.1080/15298868.2018.1439096

World Health Organization: WHO. (2024, 5 november). *Child maltreatment*. https://www.who.int/news-room/fact-sheets/detail/child-maltreatment

Appendix A

Test Materials

In accordance with the APA Ethics Code, Standard 9.11: “Maintaining Test Security” (APA, 2017), the complete items of the psychometric instruments used in this study (CTQ-SF, RSDI, SCCS, DES-II, SFQ-R) are not reprinted here to protect test integrity and copyright. Researchers who require access to the full item content could consult the original publications or contact the respective copyright holders.

Appendix B

Standardized Experimenter Script

Briefing
Welcoming the participants:
"Hi and welcome, I am [Name]. Are you both here for the eye2eye gazing study?
I will be reading off a script to keep everything standardized for all participants.
Some information on the study:
The study contains two questionnaire batteries and an eye2eye gazing session. In between the batteries, you will be asked to stop the questionnaire and let us know that you are done with the first part.
We will wait for you and the other participant to be finished, then start the eye-gazing, which will take ten minutes. After that, you will continue with the survey.
We are using forced responses. We do not think it would be fair to keep asking you to fill in questionnaires if we already know we are not able to use your data for the study. So please feel free to stop participation at any point.
We will assess childhood trauma experiences and you will undergo an eye2eye gazing session; both may be experienced as uncomfortable and distressing. Again, you can stop participation at any point. Your data will be handled confidentially, and we will not be able to track the information back to you. Please do not talk to any other students who might participate in this study about the study and put your phones in silent mode. Please sit down and start with the first questionnaire battery. There is a little note with your session number in from of your computer. The outcome of this research will be published, so please take your time answering the questionnaire."

Eye-Gazing Induction
"You are now done with the first battery, please get up and come to this side of the room. We now ask you to sit on the chairs. Please be careful, the construction may break if we bump into it. I am going to turn on the light below the construction and turn off the headlight."

"Your task is to look into the eyes of the other participant without talking. Please maintain a neutral facial expression. Keep gazing into the eyes of the other participant. The session will last ten minutes."

[Wait for the giggles to calm down, then set the timer with low brightness on your phone.]

"The ten minutes are over. Please don't speak to each other and go immediately to your computers and complete the survey. You can talk about this after the study. I am going to turn on the light. It's going to be rather bright, so feel free to close your eyes until I dim it down a little bit. Once you are done with the second battery you are allowed to leave the room quietly if you do not have any further questions."

Debrief
[On the last screen, participants are informed that they can give us a sign in case they want to talk to us in private after the study.]
"Thank you for your participation, goodbye."

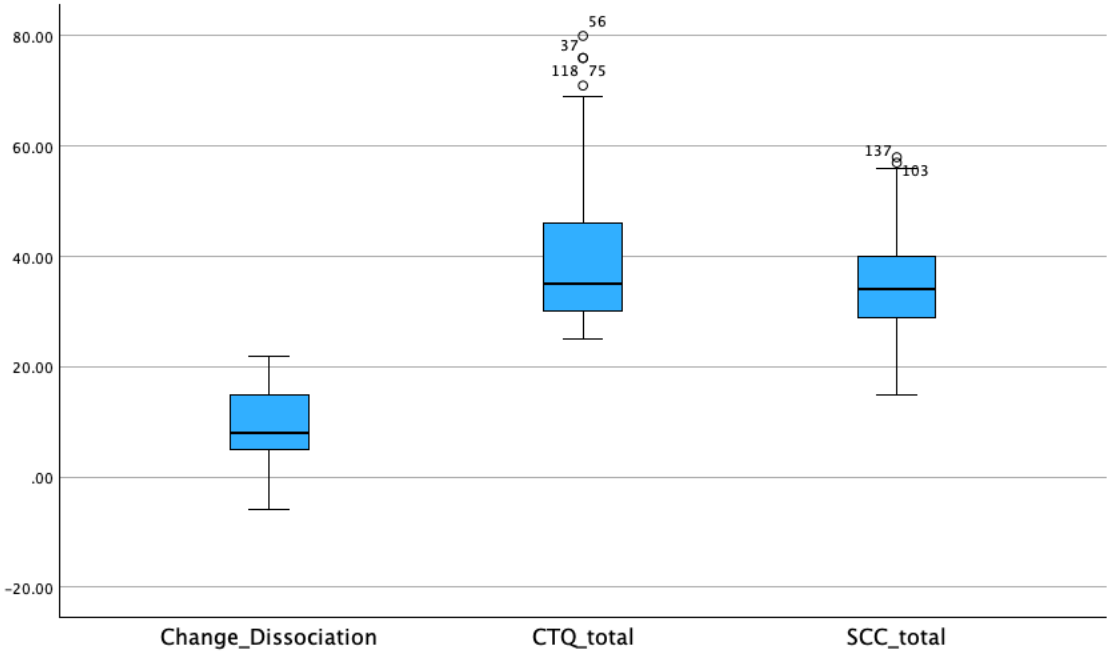
Appendix C

Informed Consent

I am aware that in this study I will be asked to keep eye contact with another participant for 10 minutes, which may feel unsettling. In addition, personal questions will be posed which may be experienced as uncomfortable.	Yes/No
I agree that my data will be handled in the way described in the information sheet.	Yes/No
By pressing the "Yes" button, you indicate that you agree with the following: 1) I have read the information about the research. I have had enough opportunity to ask questions about it. 2) I understand what the research is about, what is being asked of me, which consequences participation can have, how my data will be handled, and what my rights as a participant are. 3) I understand that participation in the research is voluntary. I myself choose to participate. I can stop participating at any moment. If I stop, I do not need to explain why. Stopping will have no negative consequences for me.	Yes, I consent to participate/ No, I do not consent and do not wish to participate in this study
We are using forced response options because we cannot use incomplete datasets and do not want to waste your time. If for any reason you do not want to answer a question, you can end your participation at any time. There will be no consequences for you.	

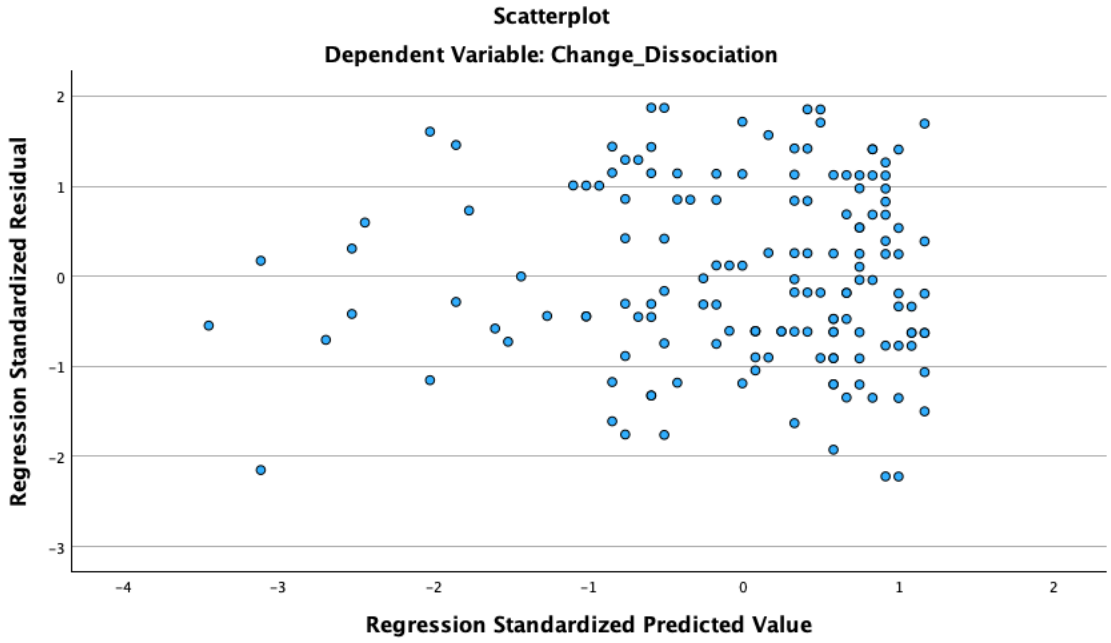
Appendix D

Boxplots of Key Variables



Appendix E

Scatterplot for Linearity Assumption

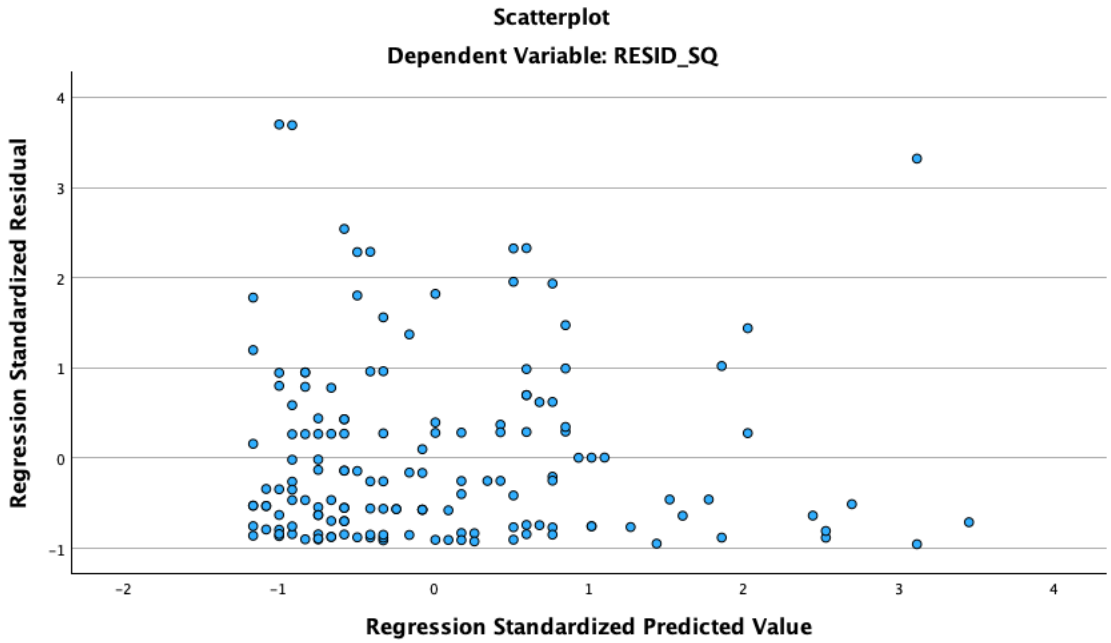


Appendix F

Assumption Testing: Homoscedasticity

Figure F1

Scatterplot of Standardized Predicted Values and Standardized Residuals



b. Predictors: (Constant), CTQ_total

Table F1

ANOVA Results for Breusch-Pagan Test (Using Squared Residuals as Dependent Variable)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	164.325	1	164.325	.063	.802[b]
	Residual	387030.077	149	2597.517		
	Total	387194.401	150			

a. Dependent Variable: RESID_SQ
b. Predictors: (Constant), CTQ_total

Appendix G

Normality of Standardized Residuals

Table G1

Descriptive Statistics for Standardized Residuals

Descriptives

			Statistic	Std. Error
Standardized Residual	Mean		.0000000	.08110713
	95% Confidence Interval for Mean	Lower Bound	-.1602600	
		Upper Bound	.1602600	
	5% Trimmed Mean		.0081117	
	Median		-.1793478	
	Variance		.993	
	Std. Deviation		.99666109	
	Minimum		-2.22286	
	Maximum		1.87154	
	Range		4.09440	
	Interquartile Range		1.48031	
	Skewness		.034	.197
	Kurtosis		-.816	.392

Table G2

Tests of Normality for Standardized Residuals

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.082	151	.015	.973	151	.005

a. Lilliefors Significance Correction

Figure G1

Histogram of Standardized Residual

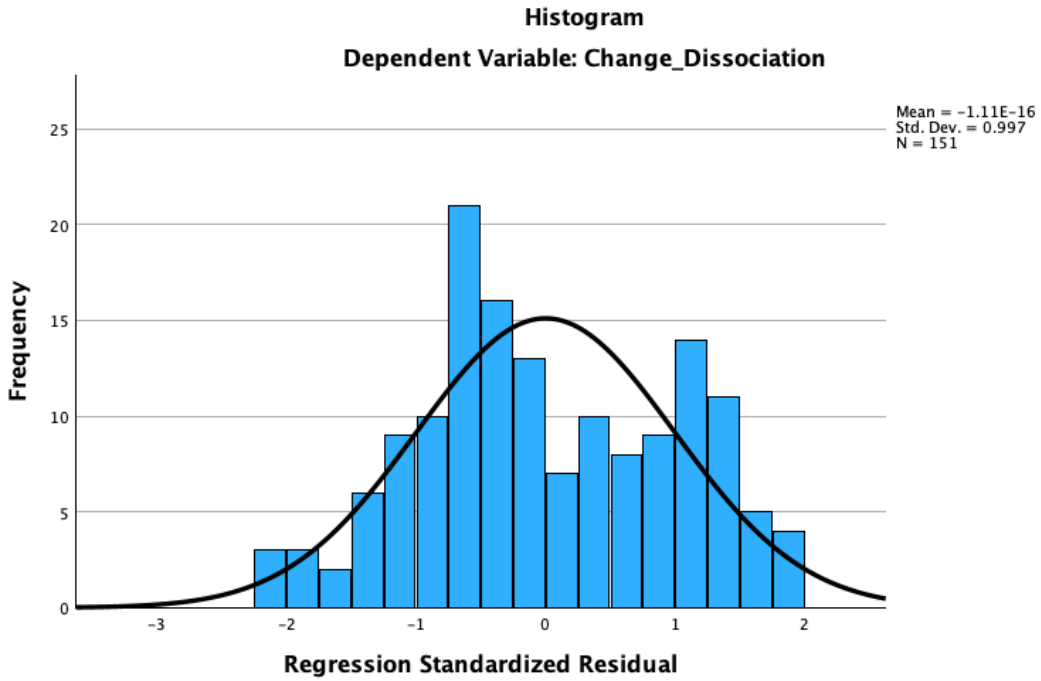
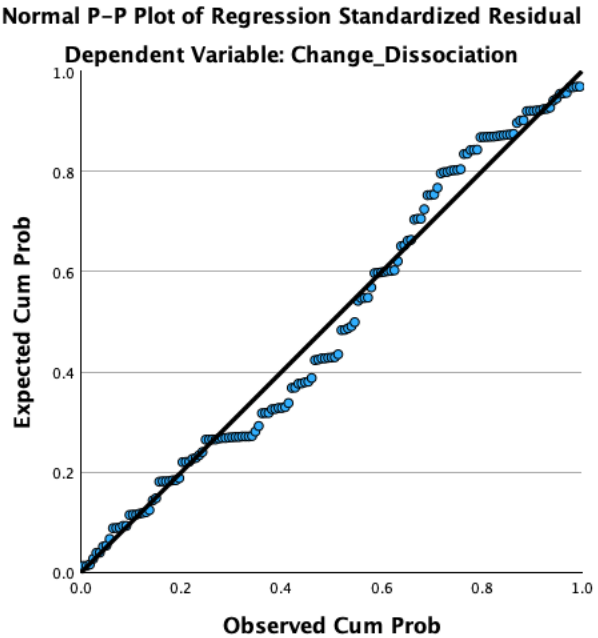


Figure G2

Q-Q Plot of Standardized Residuals



Appendix H

Durbin-Watson Test for Independence of Residuals

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.018[a]	.000	-.006	6.88574	2.072

a. Predictors: (Constant), CTQ_total

b. Dependent Variable: Change_Dissociation

Appendix I

Multicollinearity Statistics

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	9.580	1.917		4.997	<.001		
	CTQ_total	-.010	.047	-.018	-.215	.830	1.000	1.000

a. Dependent Variable: Change_Dissociation