

Examining Mentorship as a Protective Factor for ACEs Using Large Language Models

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This study explores how mentors support individuals exposed to Adverse Childhood Experiences (ACEs) by analyzing large-scale qualitative data from the ADD Health dataset. While ACEs are linked to significant long-term health and behavioral outcomes, existing research often relies on static checklists, overlooking relational and contextual nuance. Mentorship is known to promote resilience in youth, yet how mentors function in the lives of those with ACEs remains understudied, particularly within nationally representative samples containing rich narrative responses. Grounded in developmental mentoring functions and the ACE frameworks, this study advances the literature by conceptualizing mentorship as a protective factor that mitigates the negative impact of ACEs. The theoretical model emphasizes the role of supportive adult relationships in fostering coping, healing, and long-term wellbeing following adversity. We analyzed 3,635 open-ended mentorship responses using ChatGPT-4o, ChatGPT-4.5, and two human coders. Each LLM was prompted with ACE criteria, and all flagged responses—including those marked as uncertain—were reviewed by human coders for accuracy. IBM SPSS Statistics was used to compare LLM performance to human coding, and thematic analysis was conducted to identify key mentoring functions. A total of 29 unique responses were confirmed as ACE-related, revealing six core mentoring functions: providing emotional support, offering a safe and stable environment, acting as a surrogate caregiver, guiding through trauma, developing life skills, and serving as a consistent presence.

Keywords: Adverse childhood experiences, LLMs, ADD health, developmental relationships, resilience

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Introductions

Adverse Childhood Experiences (ACEs) refer to ten categories of early-life adversity first defined by Felitti et al. (1998), including psychological, physical, and sexual abuse; violence toward the mother; and household dysfunction involving substance abuse, mental illness, or incarceration. This foundational framework was later expanded to include emotional and physical neglect and parental separation or divorce (Dong et al., 2004).

ACEs are highly prevalent: 63.9% of U.S. adults report at least one, and 17.3% report four or more (CDC, 2023). These experiences are strongly associated with negative long-term health and behavioral outcomes, including increased risk of chronic illness, mental health disorders, and suicidality (Hughes et al., 2017). While ACEs have

been shown to significantly impact development, they are often assessed using static checklists that do not account for contextual factors or protective relationships that may buffer their effects (Lacey & Minnis, 2020). This underscores the value of a more holistic approach that considers both risk and resilience in understanding the long-term influence of ACEs. Given the widespread impact of ACEs, identifying protective factors that can mitigate these effects is crucial.

Review of the Literature

Mentorship has been recognized as a potential protective factor that can help youth navigate the effects of ACEs. The developmental mentoring framework model introduced by Miranda-Chan et al. 2016 suggests that mentorship in adolescence is

related to greater positive life outcomes compared to adolescents without mentors. Among these outcomes are increased psychological wellbeing, lower criminal activity, and higher levels of education, and job satisfaction (Miranda-Chan et al., 2016; Rhodes et al., 2006). This perspective is consistent with resilience theory, which aims to identify factors leading to greater wellbeing following adverse circumstances (Masten & Cicchetti 2016). The benefits of mentorship are particularly pronounced for youth from low-income or trauma-exposed backgrounds, where high-quality relationships—marked by closeness, communication, and support—can promote resilience and wellbeing (DuBois et al., 2002; Sieving et al., 2017). Mentorship has also been linked to reduced emotional distress and improved social functioning among survivors of childhood sexual abuse (Prowell & Williams, 2021). Past research has shown that mentors describe their roles as extending beyond individual guidance to include advocacy, emotional attunement, and engagement across life domains (Lakind et al., 2015). Trauma survivors describe diverse mentoring figures—such as nurturers, role models, and career guides—who played meaningful roles in their recovery (Reilly & D’Amico, 2011) yet little is known about the specific behaviors mentors enact (i.e., mentoring functions) to support mentees who have experienced ACEs. Understanding the specific mentoring functions that support youth facing adversity is critical to advancing prevention and intervention strategies.

Qualitative research offers a powerful way to uncover how mentorship supports youth in context, revealing the nuanced dynamics, emotional connections, and the meaning they assign to mentoring relationships. However, qualitative methods are resource-intensive, and large-scale narrative data is often underutilized due to the time demands of manual coding. Datasets like the National Longitudinal Study of Adolescent to Adult Health (ADD Health), which contain thousands of open-ended responses related to mentorship, represent a valuable but underexplored opportunity to understand protective mentoring functions at scale. This study applies the ACE framework to open-ended mentorship responses in the nationally representative ADD Health dataset, using both large language models (LLMs), and human coders to explore how mentoring functions may serve as buffers against early adversity.

Additionally, this research provides practical guidance for community and school-based mentoring initiatives, particularly those aimed at supporting youth who have experienced ACEs.

Methods

Participants

The current study utilized data from the ADD Health dataset, a nationally representative sample of over 20,000 adolescents (Harris et al., 2024). This longitudinal study began in the 1994-1995

school year and tracked students from grades 7 through 12 across five waves, with the most recent wave occurring between 2016 and 2018 (for details about ADD Health <https://addhealth.cpc.unc.edu/>). ADD Health data encompasses various factors including social, behavioral, cognitive, familial, psychosocial, and demographic information. The present analysis specifically examined Wave III data collected from August 2001 to April 2002, which comprised 15,197 interviews with participants aged 18 to 26.

Participants completed computer-assisted interviews, during which they answered whether they had a mentor. Those who responded affirmatively were subsequently asked the open-ended question: “How did {he/she} help you?” resulting in 3,635 qualitative responses.

Procedures

The research team used large language models (LLMs), ChatGPT-4o (original fourth model, March 2023) and ChatGPT-4.5 (updated model for more efficient performance, November 2023) to code 3,635 participant responses for evidence of mentor support in the context of Adverse Childhood Experiences (ACEs), guided by foundational Felitti ACEs framework. The LLMs identified whether support was provided in response to an ACE and, in some instances, categorized responses by ACE type. A team of five researchers reviewed these LLM-generated codes for accuracy and established consensus.

The coding procedure was subsequently repeated using ChatGPT-4.5, which was prompted to review both the Felitti framework and contemporary ACE frameworks endorsed by the Center for Disease Control and Prevention (CDC) (Dong et al., 2004). This version of the LLM flagged responses indicative of ACEs but did not categorize them—this task was completed by human coders. The LLM was also given an additional article on the CDC framework to enhance its comprehension and was permitted to mark responses as uncertain. Human coders reviewed both the flagged and uncertain responses to ensure coding accuracy.

Additionally, 2 human coders independently reviewed all 3,635 qualitative responses to identify instances where mentors supported individuals experiencing ACEs, ensuring that the LLM had not missed relevant responses. Accuracy comparisons among the independent human coders, the LLM-generated codes, human-corrected LLM codes, and entirely human-generated codes were conducted using IBM Statistical Package for the Social Sciences (SPSS). From this analysis, several thematic areas emerged, highlighting mentorship’s role in mitigating the impacts of ACEs.

Results

The standard ChatGPT-4o correctly flagged 18 mentoring responses to ACEs. An example is: “Helped me in dealing with child molestation issues.” Of the correctly identified ACEs, categories included physical abuse (16.7%), sexual

abuse (5.6%), household substance abuse (33.3%), household mental illness (5.6%), and parental separation or divorce (38.9%).

The ChatGPT-4.5 model did not identify any new, unique mentoring responses. Upon re-prompting procedures—the ChatGPT-4.5 model flagged 4 new, unique mentoring responses to ACEs. An example quote of a newly identified response is “she’s been a friend whenever my mother and father split up.” A human coder independently flagged 7 new, unique mentoring responses to ACEs. An example quote of a newly identified quote is “She was instrumental to my well being during my parents custody battle.” A second human coder independently reviewed the qualitative responses to ensure coding accuracy. Inter-rater reliability, calculated using Cohen’s kappa (κ), was substantial, $\kappa = .817$, $p < .001$, indicating strong consistency between raters (Landis and Koch, 1977).

Combining both LLM and human-coded methods, a total of 29 unique responses were accurately identified as reflecting mentors assisting mentees through ACEs. Notably, 3606 participants were not identified to have experienced an ACE.

After all 29 unique mentoring responses to ACEs were verified through cross-comparisons between two independent computer coders and LLM results—the researchers built upon the Miranda-Chan et al. (2016) developmental mentoring functions framework by utilizing thematic open-ended procedures (Braun & Clarke, 2006). Analysis of the 29 ACEs responses yielded six thematic mentoring functions of people who experience ACEs:

Provider of Socioemotional Support and Validation
Mentors provided emotional comfort and validation, helping mentees cope emotionally during challenging periods. Examples included: “She always give[s] advice, someone I could talk to about daily problems or daily events” and “He gave me moral support when parents separated

and divorced.”

Provider of Safe and Stable Environment

Mentors offered physical and emotional refuge from unstable or harmful environments. One participant noted: “She provided me with a place to live without domestic abuse and drugs,” while another shared: “She took me in when my parents kicked me out.”

Surrogate Caregiver

Mentors often filled parental roles, especially during periods of neglect, divorce, or parental absence. Responses included: “She is like a second mother to me,” and “Acted as a father since parents divorced.”

Trauma and Adversity Guide

Mentors assisted mentees in navigating severe adverse experiences. Examples included: “Helped me in dealing with child molestation issues,” and “She was instrumental to my wellbeing during my parents’ custody battle.”

Developer of Life Skills and Resilience

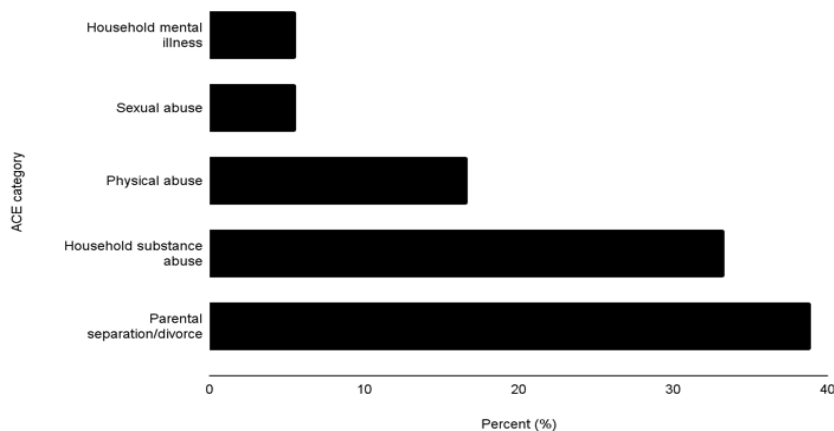
Mentors supported mentees by teaching practical skills, promoting resilience and independence. Responses included: “She has shown me that life is very important and has shown me how to be strong,” and “teaching me right from wrong.”

Stabilizer of Continuity and Consistent Presence

Mentors served as stable, consistent supports during prolonged adversity. Respondents remarked: “He was there during the tough times that I was going through at school and at home,” and “She has been there for me in bad and good situations.”

Figure 1

Distribution of Adverse Childhood Experience (ACE) Categories in Mentoring Responses Identified by GPT-4



Note. This figure identifies the most common categories of ACEs found in mentoring responses.

Table 1
Themes and Corresponding Example Quotes from Participants

Theme	Example Quote
Provider of Socioemotional Support and Validation	"She always give[s] advice, someone I could talk to about daily problems or daily events"
Provider of Safe and Stable Environment	"She took me in when my parents kicked me out."
Surrogate Caregiver	"Acted as a father since parents divorced."
Trauma and Adversity Guide	"She was instrumental to my well-being during my parents' custody battle."
Developer of Life Skills and Resilience	"teaching me right from wrong."
Stabilizer of Continuity and Consistent Presence	"She has been there for me in bad and good situations."

Note. This table illustrates key themes derived from responses about ACEs.

Discussion

Through the combined efforts of LLMs and human coders, 29 rich ACE-related mentoring narratives were identified, revealing six core mentoring functions. These findings emphasize the role of stable, supportive, and nurturing mentors in fostering resilience and emotional well-being among individuals exposed to significant childhood adversity. This study offers a novel approach to examining how mentors support youth with ACEs—an area rarely studied at this scale using existing large data repositories. While the benefits of mentoring are well-documented (Miranda-Chan et al., 2016), this study advances the literature by conceptualizing mentorship as a protective factor that mitigates the negative impact of ACEs, thereby highlighting its potential role in fostering resilience.

The six mentoring functions can be synthesized into three overarching domains: emotional safety and stability, relational surrogacy and attachment, and developmental support and empowerment. These themes align with developmental mentoring theory (Miranda-Chan et al., 2016), highlighting the importance of stable, responsive adults in mitigating the effects of adverse childhood experiences (Prowell & Williams, 2021). This research offers a practical framework for mentoring programs, emphasizing the importance of relationship-building, emotional attunement, and long-term consistency. Mentors not only serve as academic and career guides but also act as healing agents and protective figures. By identifying specific mentor roles—such as providing socioemotional support, creating safe and stable environments, and acting as surrogate caregivers—this study offers trauma-informed, evidence-based practices that can be used in community and school-based programs to support youth with histories of early adversity.

A key limitation of this study lies in the secondary nature of the data, which did not allow the authors to directly probe participants about their mentoring experiences in relation to ACEs. As a result, the analysis relied solely on instances in which participants voluntarily referenced mentoring in the context of discussing ACEs. This limits the comprehensiveness and consistency of the data regarding the mentor-ACE connection. Future research should address this gap by explicitly exploring how youth perceive and experience mentoring in relation to specific forms of adversity, thereby enabling a more targeted understanding of the protective functions that mentors may serve.

Conclusion

This study highlights the critical role that mentors can play as protective factors in the lives of youth who have experienced ACEs. Beyond providing general guidance (Miranda-Chan et al., 2016), mentors are a key source of emotional, relational, and practical support following adversity. These findings contribute to a growing body of research that positions mentoring not only as a developmental asset but as an important protective factor for youth (DuBois et al., 2002; Sieving et al., 2017). As such, mentoring programs should be designed and implemented with an awareness of their potential to serve as stabilizing, supportive, and healing influences in the lives of vulnerable youth.

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