

The Influence of Adverse Childhood Experiences (ACEs) and Age on Individual Mental Health and Couple Functioning in Couple Relationship Education Participants

by

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Abstract

Adverse childhood experiences, or ACEs, are negative events experienced throughout childhood and are consistently linked with poorer physical and mental health in adulthood. Recent literature also finds robust links between ACEs and later relational well-being. However, few studies have examined whether and how ACEs are related to individual and couple functioning before and after participation in primary prevention efforts, such as couple relationship education (CRE). Additionally, none have considered the role of age in CRE program effectiveness. The current study utilized a risk and resiliency life course perspective to explore among a diverse sample of 1,489 adult individuals in a couple relationship whether ACEs, age, and their interaction are associated with indicators of individual and couple functioning (i.e., mental health, stress, conflict management, couple quality) at the start of CRE programming and 6 months post-program. Several significant associations were found at baseline. Younger men and those with more ACEs reported lower mental health and higher stress at baseline. An interaction effect was found for women at baseline—older women with more ACEs reported the lowest levels of mental health and highest stress, followed by younger women with more ACEs compared to younger and older women with fewer ACEs. Men and women with more ACEs also reported lower levels of conflict management skills and couple quality at baseline compared to those with fewer ACEs. Regarding change over time, results revealed that younger women and women with more ACEs reported less improvement in mental health and perceived stress 6 months after the program. The combination of age and ACEs did not influence change in individual or couple functioning for either women or men. Overall, more significant associations were found between ACEs, age, and individual and couple functioning at

baseline. Less variation was found when examining change over time. CRE appears to provide benefits over time regardless of ACEs history and age. However, the findings suggest that younger women and women with more ACEs may benefit from additional supports in conjunction with CRE in the area of stress reduction and self-care. The findings suggest the importance of screening for ACEs prior to programming, developing trauma-informed approaches, and implementing more individual-focused content into CRE curricula. Further implications and future directions are discussed.

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CHAPTER I: Introduction

The link between childhood environment and adult outcomes is seen in nearly all aspects of well-being. Numerous studies have shown that a child's upbringing can affect not only their later physical health (e.g., Crandall et al., 2019), but also their later mental (e.g., Crouch et al., 2018), social (e.g., Ferraro et al., 2016), spiritual (e.g., Walker et al., 2009), and financial well-being (e.g., Zielinski, 2009). Broadly, research finds more favorable environments bolster positive outcomes (e.g., Bethell et al., 2019), and significant research documents the risk of long-term impacts from negative, or adverse, childhood experiences. The current study explores whether childhood adversity influences individual and relational functioning at the start of and following couple relationship education (CRE). Surprisingly, this consideration is rare in research on CRE even though the last decade has emphasized the widespread delivery of these couple programs to more vulnerable populations (Hawkins, 2010). We also consider whether participant age – another participant characteristic given little attention in CRE research - and the intersection of age and number of adverse childhood experiences are linked to individual and couple functioning at the time of CRE enrollment and over time.

Near the turn of the new century, Felitti and colleagues (1998), Kaiser Permanente physicians, led a revolutionary study on early negative experiences and coined the term “adverse childhood experiences (ACEs)” to refer to potentially traumatic events that can occur in a child's life (i.e., ages 0-18). The original ACEs study surveyed a large group of adults and included 17 questions focused on retrospective reports of 7 types of abuse and household challenges. More specifically, the ACEs examined in the original study included three categories of childhood abuse (i.e., psychological, physical, and contact sexual abuse) and four categories of exposure to household dysfunction (i.e., exposure to substance use, mental illness, violent treatment of

mother or stepmother, and criminal behavior). Later studies added 3 more categories and included physical and emotional neglect, and parental separation or divorce (e.g., Anda et al., 2009; Dube et al., 2003). On the index of 17 items from the first ACEs study (Felitti et al., 1998) and using a scale score of 0-7, over half (52%) of the 8,506 adult respondents (mean age= 56.1) reported having at least 1 ACE between ages 0-18; a quarter (25%) reported 2 or more ACEs; 13% reported 3 or more. A key takeaway from this study was that those who had experienced more than one form of childhood adversity were more likely to have multiple health risk factors as adults. Additionally, Felitti and colleagues (1998) found a graded dose-response relationship indicating that as the number of ACEs increased, the risk of negative health and well-being also increased. This study published in a medical journal is considered a key influence on medical practitioners' shift to including in health intake assessments questions related to children's social risk factors (e.g., Bethell et al., 2017; Gill et al., 2019). Since then, there has been continual growth and expansion in ACEs research among a broad range of scholars to better understand the prevalence of ACEs and their implications.

ACEs and Individual Outcomes

While physical health outcomes were a main focus in the original ACEs study due to the researchers' role as physicians (Felitti et al., 1998), more recently there has been increased research attention on the possible negative impact of ACEs on later mental health symptomology and diagnoses (e.g., Danese et al., 2009; Mersky et al., 2013). A greater number of ACEs are associated with higher levels of stress as adults, and perceived stress has a robust link to mental health challenges (e.g., Chu, 2014; Karatekin & Ahluwalia, 2020; Shavitt et al., 2016). Additionally, stress has been found to mediate the relationship between ACEs and worsened mental health (Karatekin, 2018). As such, other research examining direct associations find that a

greater number of ACEs is associated with adults' greater mental health symptomology (e.g., Karatekin, 2018; Karatekin & Ahluwalia, 2020). In fact, one study noted that experiencing more than one ACE can double the risk of reporting frequent depression and anxiety symptoms (Mersky et al., 2013). Other studies that emphasize clinical diagnoses consistently find that ACEs are associated with developing depression in adulthood (e.g., Danese et al., 2009; Chapman et al., 2004). Chapman and colleagues (2004) found a graded relationship between ACEs score and the likelihood of lifetime and recent depressive disorders. Further, a number of studies have indicated that depression is related to overall mental health and well-being (e.g., Achat et al., 2000; Weijers et al., 2020).

ACEs and Relational Outcomes

In more recent years, social scientists have focused on the possible link between ACEs history and adult relationship functioning (e.g., Umberson et al., 2014; Wheeler et al., 2019). More generally, experiencing childhood adversity is related to reports of higher levels of couple interpersonal problems and relationship strain (Paradis & Boucher, 2010; Umberson et al., 2014). A number of studies explore specifically the links between ACEs and intimate partner violence (IPV), with the majority of these studies indicating that those exposed to more ACEs are more likely to perpetrate and/or be victims of IPV (e.g., Swopes et al., 2013; Whitfield et al., 2003). ACEs might be associated with both perpetration and victimization if individuals have experienced and/or witnessed aggression throughout childhood, especially ACEs such as physical abuse or violent treatment of mother/stepmother, and then model these behaviors as adults. This intergenerational transmission of abuse and victimization is well-documented (e.g., Cannon et al., 2009; Franklin & Kercher, 2012). Further, Swopes and colleagues (2013) found an indirect link through PTSD symptoms, which suggests that the link between ACEs and later

relationship dysfunction is at least partially explained by mental health challenges and distress that likely manifest in dysfunctional relationship practices, such as utilizing poor conflict management skills, which could lead to aggression or IPV (Swopes et al., 2013; Wheeler et al., 2019). In addition, recent research finds strong associations between ACEs and verbal and physical aggression for young adults (e.g., Mumford et al., 2019; Nikulina et al., 2017).

Given the potential for unfavorable and cumulative effects of ACEs, practical recommendations include early and comprehensive interventions to build protective factors that promote healthy individual and relational functioning. Suggestions include youth development programming (Mumford et al., 2019) and clinical interventions for couples and individuals (e.g., Hecker, 2007; Nikulina et al., 2017). Promising evidence shows that emotionally focused therapy (EFT) can have significant positive effects on relationship distress and satisfaction for couples when a partner experienced childhood trauma (Dalton et al., 2013). Overall, however, there is limited research considering the role of ACEs in couple-focused programs, particularly more primary prevention and education, even though the prevalence of at least one ACE is quite high in the population and in the last decade there has been a surge of research evaluating CRE programs (e.g., Stanley et al., 2020). That is, little is known about whether and how the number of ACEs is related to individual and relational functioning among participants in a community-based couple relationship education (CRE) program.

Couple Relationship Education (CRE) and ACEs

Healthy couple relationships are associated with important positive outcomes for individuals and families. Specifically, individuals in healthy relationships are healthier, live longer, and have lower levels of mental health challenges (e.g., Bookwala & Gaugler, 2020; Leach et al., 2013; McShall & Johnson, 2015). Healthy couple relationships also benefit children

in the family and enhance their positive developmental outcomes (e.g., Goldberg & Carlson, 2014; Nepl et al., 2017). For this reason, unprecedented federal support over the last 15 years has been provided for educational programs that support healthy couple relationships in an effort to help individuals and couples develop and maintain healthy couple relationships and in turn, strengthen families (e.g., Simpson et al., 2018). A significant body of research has examined CRE programs in a variety of contexts and populations and has found promising outcomes and efficacy (e.g., Arnold & Beelmann, 2019; Cottle et al., 2014; Hawkins, 2019; Hawkins & Fackrell, 2010; Lucier-Greer & Adler-Baeder, 2012; Stanley et al., 2020). Although indications are that CRE can be effective for the average participant in improving mental health (e.g., Adler-Baeder et al., in press) and various indicators of relational health such as communication skills, relationship quality, and relationship satisfaction, particularly in the short-term and up to one year later (e.g., Adler-Baeder et al., in press; Halford & Bodenmann, 2013; Hawkins et al., 2008), other research has found that there are various factors that can influence the effectiveness of CRE such as marital status, income, and race (e.g., Adler-Baeder et al., 2010; Rauer et al., 2014). For example, some studies find greater improvements for individuals with lower income and those who are married (Adler-Baeder et al., 2010; Arnold & Beelmann, 2019; Rauer et al., 2014).

Relevant to the current study, more vulnerable and distressed individuals are attending CRE (e.g., Amato, 2014; DeMaria, 2005), further warranting the analysis of adversity's role in CRE. Some research finds that individuals reporting higher distress and relational instability at program start reported greater gains after CRE participation (e.g., Carlson et al., 2017; McGill et al., 2016). Other studies find enhanced CRE program benefits for more economically and

socially disadvantaged participants (e.g., Amato, 2014). This is welcome news for a “do no harm” approach to primary prevention.

Only a handful of studies have specifically considered early adversity and its implications for the CRE experience (Cooper et al., 2019; Cooper et al., 2020; Cooper et al., 2021; Wheeler et al., 2019; Wheeler et al., 2020). Wheeler and colleagues (2019) found that number of ACEs and reports of physical and mental health at baseline were related among a sample of 96 CRE participants in an individual-oriented relationship education program (i.e., attending relationship skills training individually, whether single or in a couple relationship) and this link was moderated by relationship distress, such that relationship distress strengthened the predictive relationship between ACEs and health. In fact, they found that almost half of the variance in physical and mental health symptoms was accounted for by ACEs and relationship distress (Wheeler et al., 2019). They also found that those reporting four or more ACEs saw the largest drop in individual distress scores from pre- to post-program (Wheeler, et al., 2020). Cooper and colleagues (2019; 2020; 2021) found among a large, diverse sample of individuals attending CRE as a couple a significant negative association between the number of ACEs and relationship quality at baseline and found that those with four or more ACEs saw greater immediate post-program improvements in self-reported relationship quality than those with fewer ACEs. In a comparative model, however, they found the number of ACEs did not influence gains in relationship quality, when feelings of relationship self-efficacy were considered. The stronger predictor of individuals’ reported relationship quality improvements was self-reported relationship self-efficacy.

Although these studies provide some initial evidence that CRE may be a useful resource for individuals who have experienced ACEs, there is considerable room for growth and

expansion of the knowledge base that can serve to inform both researchers and practitioners. Because current populations of couples attending CRE are diverse in age, we can also explore the implications of this for CRE program effectiveness, particularly in combination with reports of ACEs. The few studies that assessed ACEs for CRE participants did not consider individuals' developmental proximity to the childhood experiences.

CRE and Development

In earlier decades of research on CRE programs, samples were primarily newly married or engaged couples and university populations (e.g., Braithwaite & Fincham, 2009; Doherty, et al., 2003; Fincham et al., 1997; Hawkins et al., 2004; Olmstead et al., 2011; Schofield et al., 2015). Although newly married and engaged couples can be “blinded” by new love and report higher relationship satisfaction at program start (Schofield et al., 2015) potentially creating a “ceiling effect” with limited room for improvement, multiple studies found promising results when CRE was provided to college students and young couples, such as significant improvements in positive attitudes, greater relationship skill knowledge, and better communication skills (e.g., Bradford et al., 2016; Cottle et al., 2014; Doherty, et al., 2003). Some scholars note that many of the concepts and skills taught in RE programs (e.g., healthy communication patterns, decision-making skills) are particularly relevant for young adults who are more newly focused on forming healthy relationships in many aspects of their lives (Vennum et al., 2017). Other scholars suggest that each life stage offers a unique opportunity for growth in relationship skills and efficacy of CRE programs (Hawkins et al., 2004). For example, adolescence is a period when individuals are newly interested in couple relationships and are forming attitudes and building skills; those in middle adulthood may face challenges in their couple relationships due to increasing work and family or child-rearing demands; and couples

post-retirement may face new relationship challenges when health issues arise. Recent studies have examined the influence of life stage and relationship length on individual and relational functioning following CRE (Crapo et al., 2020; McGill et al., 2021). Results indicate that individuals in later life stages experienced greater increases in relational functioning from pre- to post-program than those in earlier life stages (Crapo et al., 2020). Similarly, McGill and colleagues (2021) found that individuals in longer relationships (which was significantly correlated to age), experienced greater change in couple functioning, specifically conflict management skills and couple quality.

Current samples of couples in CRE have been quite age-diverse (e.g., Stanley, et al., 2020; Adler-Baeder, et al., in press); however, the influence of age on program effects has not been widely considered beyond that of a covariate. In addition, a study focused on reports of ACEs would also benefit from considering the reporter's age. ACEs are events that occur under the age of 18 and young adults are most proximal to these events, potentially making them more vulnerable to the risks (Logan-Greene et al., 2014), and comparatively less likely to improve following an intervention. Alternately, we can consider that emerging adulthood may be a good time period to provide CRE, when relationships are newer and there has been less time to have developed longer-term individual and relationship dysfunction or to have accumulated more adverse experiences (Cottle et al., 2014). Thus, it may be that older persons with higher ACEs may be less likely to benefit from intervention or education.

Theoretical Assumptions

Embedded in the current study are assumptions drawn from complementary models and perspectives. In many of the studies assessing the impact of ACEs, a cumulative risk model is articulated. The central tenet of this perspective is that more disadvantages (or advantages) in

childhood and adolescence will lead to more disadvantages (or advantages) throughout life (Evans et al., 2013), and as previously noted, much of the research on ACEs supports this notion (e.g., Chapman et al., 2004; Danese et al., 2009; Mersky et al., 2013; Umberson et al., 2005). Because negative outcomes are not inevitable, a risk and resiliency perspective (e.g., Masten & Powell, 2003), serves to explain the decreased likelihood of a strong linear connection between number of ACEs and negative outcomes. Protective factors, which can take the form of characteristics or resources - such as the skills and information shared in CRE - may serve to mitigate the potential negative effects of ACEs.

We also incorporate a developmental perspective and consider whether the relationship between ACEs and individual and relational functioning may differ due to age. Life course theory emphasizes the ways in which time, culture, context, and the interdependence of family relationships influence individuals' lives (Allen & Henderson, 2017). The developmental impact of life transitions or events is dependent on when they occur in a person's life (timing) and where a person is currently in the life course (Elder, 1998). As such, the influence of ACEs may differ over the lifespan and the effectiveness of receiving a resource, such as CRE, may differ based on developmental trajectory.

The Current Study

Taken together, both research and theory suggest that ACEs can have significant and deleterious impacts on physical health, mental health (depression and anxiety), stress, and relational health (e.g., couple interpersonal problems). In addition, studies of CRE find benefits for a broad population of adults (e.g., Adler-Baeder et al., in press), and suggest enhanced benefits for more vulnerable individuals (e.g., Amato, 2014; Carlson et al., 2017; McGill et al., 2016). A recent efficacy study using the same sample of couples as the current study found

evidence of program impact for the average CRE participant compared to control (no-program) participants in mental and couple quality (Adler-Baeder, et al., in press). Building on this, the current study explores variation in the program experience among participants. As noted, very limited information exists on whether and how the age of participants and their number of ACEs influence their individual and relational functioning in the context of CRE. Only five studies of CRE have assessed ACEs and their implications for program effects (Cooper et al., 2019; Cooper et al., 2020; Cooper et al., 2021; Wheeler et al., 2019; Wheeler et al., 2020). Wheeler and colleagues (2019, 2020) focused exclusively on individual distress, rather than relationship functioning and measured only immediate post-program changes. Cooper and colleagues (2019, 2020, 2021) assessed relationship functioning at baseline and at immediate post-program; however, they did not consider age of the participant.

The current study used a risk and resiliency approach and a developmental lens and sought to understand whether and how ACEs, age, and the combination of the two were related to individual and relational functioning at baseline and at 6 months after program participation among a diverse group of individuals participating with their partner in a CRE program. Four indicators of individual and couple functioning were assessed: mental health, perceived stress, conflict management skills, and couple quality. Specifically, the following research questions were explored.

- a. **RQ1:** What are the associations between ACEs, age, individually and in combination, and individual and couple functioning (i.e., mental health, stress, conflict management, couple quality) at CRE program start for men and women?

- b. **RQ2:** Do ACEs, age, and the interaction of ACEs and age predict change in individual and couple functioning six months after program enrollment for men and women participants in CRE?

CHAPTER II: Literature Review

In the following chapter, I will provide a more detailed summary of the previous research on ACEs and on CRE, with emphasis placed on the research exploring the possible deleterious impacts of ACEs on mental health and couple functioning, since physical health outcomes are not a focus in the current study. Additionally, the limited research on the role of age and the role of ACEs in the context of CRE will be presented, along with a summary of the theoretical assumptions that guide the current study. Lastly, the limitations of the current literature will be highlighted as a basis for establishing the contributions of the current study.

ACEs and Individual Outcomes

Although the original ACEs study was healthcare-based and primarily focused on physical health outcomes, Felitti and colleagues (1998) also reported links between childhood adversity and later mental health outcomes. In fact, in the sample of 8,056 men and women, those who had experienced just one ACE were more likely to feel depressed for two or more weeks in the past year, with the odds increasing for each additional ACE. The same graded dose-response relationship was found between ACEs and ever attempting suicide, with those experiencing one ACE almost twice as likely to ever attempt suicide.

Since then, multiple other studies have linked ACEs and mental health outcomes (e.g., Chapman et al., 2004; Danese et al., 2009; Karatekin, 2018; Karatekin & Ahluwalia, 2020; Mersky et al., 2013). These types of studies represent a shift from child development research that examines one type of childhood adversity singularly (e.g., parental divorce, physical abuse, sexual abuse, neglect) and longitudinal consequences and emphasizes the importance of considering accumulation of adverse experiences. For adults, there appears to be a strong association between undergoing more childhood adversity and developing a depressive disorder

(e.g., Chapman et al., 2004; Danese et al., 2009). Specifically, Chapman and colleagues (2004) found, in a sample of 9,460 adults (54% female, 75% White), a strong and significant dose-response relationship between ACEs score and the likelihood of both lifetime and recent depressive disorders. This study supports assumptions in the cumulative risk model that more ACEs lead to a stronger dose-response relationship with depressive disorders over time. Moreover, they found these cumulative effects to be stronger for women; women were more likely to develop recent and lifetime depressive disorders (Chapman et al., 2004). Similarly, Danese and colleagues (2009) sought to understand why individuals with exposure to childhood adversities were at higher risk for age-related diseases, with major depression serving as a main risk factor for these diseases. Measuring three of the types of ACEs - childhood exposure to low socioeconomic status (SES), maltreatment, and social isolation - they followed a cohort of 1,037 adults (52% male) over 32 years. They tested their comparative influence and their accumulated influence. All three adversities increased the risk of developing major depression, with those experiencing childhood maltreatment at the highest risk for depression. Further, those with more of the childhood adversities had a greater risk of developing major depression, supporting the cumulative risk perspective. Further, depressive symptomology is linked to general mental health and well-being (e.g., Achat et al., 2000; Weijers et al., 2020). Using a sample of 659 individuals, Achat and colleagues (2000) discovered a negative association between depressive symptomology and levels of functioning across all domains (physical functioning, social functioning, emotional functioning, and mental health). More recently, researchers discovered that depressive symptom severity was significantly and negatively correlated to overall well-being at baseline and the six-month follow-up among a sample of 77 individuals with major

depressive disorder (Weijers et al., 2020). These findings suggest that it might be useful to utilize a more global measure of mental health.

In addition to depressive symptoms and disorders, ACEs have also been linked to higher levels of stress, which is associated with further mental health challenges (e.g., Chu, 2014; Karatekin, 2018; Karatekin & Ahluwalia, 2020; Shavitt et al., 2016). Using a sample of 239 college students, Karatekin (2018) examined the links between ACEs, current stressors, and mental health. Results indicated that stress mediated the link between ACEs and worsening mental health, with suggestions to provide stress-related interventions for individuals with more ACEs. Karatekin and Ahluwalia (2020) looked at the nature of ACEs reported by a sample of 321 college students (76% female, 72% White) to investigate the effects of ACEs, perceived stress, and perceived social support on their mental health. Overall, all three variables (ACEs, social support, and stress) explained more than half the variance in mental health scores, with perceived stress having the biggest impact (Karatekin & Ahluwalia, 2020). A number of other studies have also linked perceived stress to mental health (e.g., Chu, 2014; Shavitt et al., 2016). Chu (2014) examined the associations between perceived stress, work-family conflict (WFC), and mental health using a sample of 273 female healthcare workers. Overall, results indicated that perceived stress was predictive of higher levels of WFC and lower levels of mental health. However, person-environment fit, the compatibility between an individual's personal characteristics and their work environment, was found to buffer these effects (Chu, 2014). Similarly, Shavitt and colleagues (2016) assessed the relationships between perceived stress and mental and physical health, while considering social support. They utilized an ethnically diverse sample of 603 individuals (44% female) with approximately equal numbers of non-Hispanic Whites, Mexican Americans, Korean Americans, and African Americans, to consider the role of

culture. A negative correlation between perceived stress and self-reported physical and mental health was found for all cultural/ethnic groups. More specifically, there was a positive and significant relationship between stress and depression. However, social support was found to provide a buffering effect in this relationship for Mexican Americans (Shavitt et al., 2016).

Taken together, the current study included measures of stress and mental health for the relevance to the study of ACEs and CRE. A growing body of research builds on the robust findings of the studies of ACEs and individual outcomes and examines the implications of ACEs on relational functioning and interpersonal risk.

ACEs and Relational Outcomes

Scholars note that “a holistic view of health incorporates relationship health” (Wheeler, et al., 2019, p. 1015). Not only can ACEs affect individual functioning, but they also influence relationships. Specifically, different forms of childhood maltreatment can lead to reduced relational intimacy, increased relational conflict, relationship strain, boundary issues, hypervigilance, trust issues, and more (e.g., Hecker, 2007). One meta-analysis examining 48 studies found a significant association between childhood maltreatment and IPV victimization. Although this relationship was stronger for dating couples than for married couples, there were no significant differences between men and women (Li et al., 2019). Scholars emphasize the likely mental health challenges that result from child maltreatment as a pathway to susceptibility to victimization in later relationships, particularly for women (e.g., Parks et al., 2011). A more recent meta-analysis that included 63 studies found a significant positive relationship between childhood maltreatment and IPV perpetration, with this relationship stronger for men (Li et al., 2020). This supports the number of studies that report men are more likely to externalize (i.e., antisocial behaviors, aggression), whereas women are more likely to internalize (i.e., anxiety,

mood disorders, withdrawal) after experiencing childhood adversity (e.g., Essex et al., 2003; Muniz et al., 2019; Sigurdardottir et al., 2014).

The accumulation of ACEs has been linked to relationship distress (e.g., Wheeler et al., 2019), relationship quality (Umberson et al., 2005), interpersonal issues (e.g., self-sacrificing, being cold/distant, domineering/controlling, or nonassertive; Paradis & Boucher, 2010), and intimate partner violence (IPV) (e.g., Whitfield et al., 2003). In fact, much of the research that assesses for multiple ACEs and focuses on couple relationships has focused on the connection between childhood adversity and being a perpetrator and/or victim of intimate partner violence (IPV) or physical aggression (Li et al., 2019; Li et al., 2020; Montalvo-Liendo et al., 2015; Whitfield et al., 2003; Swopes et al., 2013; Thulin et al., 2021). Not only can ACEs be related to IPV indirectly through mental health issues, but this link might also be a result of utilizing poor conflict management skills when experiencing distress in a couple relationship (Swopes et al., 2013; Wheeler et al., 2019).

Studies document a robust link between accumulated childhood adversity and risk of both perpetration and victimization, although rates differ between men and women, similar to the research focused on forms of child maltreatment and later IPV. In addition, a literature review from Montalvo-Liendo and colleagues (2015) of 42 studies of ACEs and IPV and focused on likelihood of experiencing IPV asserts descriptively that women with ACEs are much more likely to experience intimate partner violence, among other negative outcomes; however, this comparative assumption is not empirically tested through meta-analytic procedures.

Using a sample of 8,629 adults, Whitfield and colleagues (2003) focused only on three types of childhood adversities (physical abuse, sexual abuse, and witnessing domestic violence) and found that each doubled the risk of IPV perpetration or victimization. When considering the

accumulation of experiences, they found that for both men and women, those who had experienced all three forms of adversity were over three times more likely to be a perpetrator or victim of IPV, respectively. Moreover, there was a statistically significant graded relationship between the reported number of violent experiences and the risk of IPV. Swopes and colleagues (2013) used a sample of 108 male IPV offenders (49% White, 22% African American, 20% Native American) and found that experiencing childhood adversity was indirectly linked to partner aggression through the severity of PTSD symptoms. This suggests that the relationship between ACEs and IPV perpetration and/or victimization may be related to other mental health issues. More recently, Thulin and colleagues (2021) surveyed 499 individuals (80% African American) in adolescence (13-19) and then again 15 years later (28-34) to determine the relationship between adolescent-reported ACEs and intimate partner violence in adulthood. Overall, researchers found a predictive relationship between number of ACEs in adolescence and being a victim of intimate partner violence in adulthood for all participants.

In recent years, more attention has been placed on the connection between ACEs and IPV specifically in young adult relationships (Nikulina et al., 2017; Mumford et al., 2019; Cprek et al., 2020). In a diverse sample of 284 college students (37% White, 30% Asian, 27% Hispanic, 33% Other), all in a couple relationship, the number of ACEs were found to be associated with physical aggression. Specific ACEs associated with the perpetration of physical aggression included physical abuse and growing up with incarcerated caregivers. Additionally, a significant association was found between witnessing domestic violence and the perpetration and/or victimization of physical aggression. The authors report that IPV is likely to decrease with age and suggest that interventions with high-risk college students (i.e., those assessed for higher number of ACEs) may prevent intergenerational transmission of IPV. They emphasize also the

importance of dyadic interventions that address aggression and perpetration by both the individual with higher ACEs and their partner since many individuals report both victimization and perpetration (Nikulina et al., 2017).

Mumford and colleagues (2019) also examined the effects of ACEs on later violence and aggression in young adult relationships. Using a sample of 2,284 young adults, ages 18-32, they found a direct association between ACEs and outcomes involving aggression. Specifically, ACEs and recent life stressors were shown to have direct associations with verbal and physical aggression. For those reporting any aggression, childhood abuse was significantly associated with more frequent verbally aggressive behavior towards their intimate partner. These researchers advise clinical treatment for young adults and for preventative measures, they recommend positive youth development programming that demonstrates healthier ways to handle conflict (Mumford et al., 2019).

A more recent study utilized 2,900 undergraduate students (59% female, 85% White) to assess the relationship between ACEs and violence. Over half of the sample (54%) reported 0 ACEs, but more than one-third (37%) reported 1-3 ACEs. A smaller percentage (4%) of undergraduates reported 4 or more ACEs. Overall, those who reported more ACEs were more likely to experience interpersonal violence. More specifically, those with 4 or more ACEs were about 2 to 5 times more likely to experience violence. Additionally, a dose-response relationship was found, such that a higher ACEs score was associated with more experiences of violence (Cprek et al., 2020).

Two factors that often lead to conflict, relationship strain and distress, can also be influenced by ACEs (Umberson et al., 2014; Wheeler et al., 2019). Similar to what is proposed in the current study, both life course and cumulative risk perspectives were utilized by Umberson

and colleagues (2014), treating childhood as a sensitive period of the life course, and acknowledging that adverse experiences during this stage may lead to cumulative disadvantage in relationships and other realms of health over time. Using a sample of 3,477 adults (63% female, 34% Black), they found a strong and consistent association between childhood adversity and higher levels of relationship strain at baseline, with increases in relationship strain in adulthood over three years. In a racially diverse and low-income sample of 96 adults (87% ethnic or racial minority, average annual income = \$13,500) receiving individual-oriented relationship education (RE), Wheeler and colleagues (2019) found that the predictive relationship between ACEs and physical and mental health was strengthened by relationship distress. (It is important to note that participants completed the questionnaires on the first and last day of the workshop, which was typically within the same week.) Additionally, ACEs and relationship distress accounted for almost half of the variance in physical and mental health symptoms reported at baseline (Wheeler et al., 2019).

An earlier study (Umberson et al., 2005) using a life course perspective suggested that childhood adversity has the potential to indirectly influence marital quality through stress in adulthood. Participants were assessed across three waves spanning 9 years, and reported on current marital quality, stressful childhood experiences that occurred before age 16, and adult stress, which included significant events in several domains that had occurred in the three years prior to the first interview and in the years between each wave. Using a sample of 1,059 married individuals, they found that the association between adult stress and marital quality was particularly robust for those who faced more stressful childhood experiences. Another study (Paradis & Boucher, 2010) of 1,728 university students (81% female, 93% White) had participants respond to measures of childhood sexual abuse, childhood emotional abuse, physical

abuse and neglect, and couple interpersonal problems through a single online survey. They ultimately found that more experience with childhood maltreatment led to higher reports of couple interpersonal problems, with this association stronger for men. Both studies address the importance of considering and addressing childhood adversity in interventions focused on couple relationships in order to better help participants strengthen and maintain healthy relationships (Paradis & Boucher, 2010; Umberson et al., 2005). Further, the accumulated evidence suggests the inclusion of measures of conflict management skills and couple relationship quality in the study of ACEs and CRE.

ACEs and Relationship Intervention

There is clear research indicating the potential for relational issues to arise from ACEs, but there is not as much clarity about approaches to lessen the relational (and individual) consequences. It is likely that childhood trauma has a considerable impact on couple relationships, since the timing of adversity can have drastic effects on how one forms and maintains attachments with other people. Therapy is a common method for treating individuals and couples who have experienced childhood adversity. When couples are brought together with guidance to respond to early trauma, it allows them to construct a shared meaning, and often leads to a stronger and more resilient couple (e.g., Hecker, 2007). A more concentrated method of addressing the impacts of childhood trauma in a couple relationship is emotionally focused therapy (EFT). In a sample of 22 couples (86% White) in which the female partner had experienced intrafamilial childhood abuse, Dalton and colleagues (2013) found statistically and clinically positive significant effects on relationship distress after utilizing EFT, along with significant increases in relationship satisfaction for the couple (Dalton et al., 2013). Overall, however, there is a limited research focused on couple interventions for specifically addressing

the ACEs of one or both partners in couple relationships, although early trauma is often included in intake assessments (Basham, 2005).

Several of the studies addressing the consequences of cumulative childhood adversity emphasize the potential value of providing comprehensive interventions to help buffer the negative effects of ACEs on individual and relational functioning (e.g., Mumford et al., 2019; Paradis & Boucher, 2010; Umberson et al., 2005). A variety of approaches have been suggested, from more universal preventative measures such as positive youth development programs (Mumford et al., 2019) to focused therapy (Dalton et al., 2013), yet there is limited consideration in studies of broader, youth and family life educational programs of participants' ACEs history and its implications. This is especially true in the field of couple relationship education (CRE) programming and evaluation.

CRE and ACEs

Being a part of a healthy couple relationship leads to numerous positive outcomes. Those with higher quality relationships have better overall health, lower rates of depressive and anxiety symptoms, and live longer (e.g., Bookwala & Gaugler, 2020; Leach et al., 2013; McShall & Johnson, 2015). A large body of research also supports the notion that children in families with healthy couple relationships fare better in a number of outcome areas (e.g., Goldberg & Carlson, 2014; Neppl et al., 2017). Because of this, educational programs promoting healthy couple relationships have been supported by federal funding for more than 15 years (Hawkins, 2019). These programs aim to help individuals and couples develop and maintain healthy couple relationships and in turn, strengthen families (Simpson et al., 2018). A large body of research exists focused on CRE programs in a variety of different contexts and populations and multiple meta-analytic studies confirm evidence of positive program effects (e.g., Arnold & Beelmann,

2019; Cottle et al., 2014; Hawkins & Fackrell, 2010; Lucier-Greer & Adler-Baeder, 2012; Stanley et al., 2020). CRE has been shown to improve communication skills, relationship quality, and relationship satisfaction (e.g., Halford & Bodenmann, 2013; Hawkins et al., 2008). Hawkins and colleagues (2008) examined the efficacy of marriage and relationship education using 117 independent studies, specifically looking at relationship quality and communication skills. The results yielded small-to-moderate effect sizes, with large effect sizes seen for moderate-dosage programs (versus low-dosage).

Another study looked at the evaluations of 15 different CRE programs targeted at lower-income couples and found small-to-moderate effects or improvements, specifically for relationship quality and communication skills (Hawkins & Fackrell, 2010). Another meta-analysis investigated the effectiveness of CRE for stepfamilies using 14 evaluation studies and reported small effects overall, but slightly larger effects for family and parental functioning outcomes (Lucier-Greer & Adler-Baeder, 2012). Halford and Bodenmann (2013) assessed 17 studies of CRE and found that 14 of those studies reported long-term (at least 1-year) benefits of CRE, specifically on the maintenance of relationship satisfaction. More recent CRE literature points to small, but statistically significant and stable overall effects on indicators of individual, couple, and family functioning after CRE participation, especially when attendance rates are high (e.g., Adler-Baeder et al., in press; Arnold & Beelmann, 2019; Halford & Bodenmann, 2013; Hawkins et al., 2008; Stanley et al., 2020). Researchers emphasize the importance of retention in order for couples to maximize the long-term benefits of CRE (Arnold & Beelmann, 2019; Stanley et al., 2020).

Another group of studies of CRE, particularly those including more diverse samples, explore factors such as marital status, income, and race for their potential influence on the

effectiveness of CRE (e.g., Adler-Baeder et al., 2010; Rauer et al., 2014). For example, Adler-Baeder and colleagues (2010) assessed the impact of various demographic predictors on baseline levels and change across time on individual and relational target areas. Using a sample of 1,293 ethnically and economically diverse adults (57% African American, 61% low-income), they found that income was the strongest predictor of baseline levels, such that higher income predicted higher baseline levels in all target areas. Income was also associated with changes in relational functioning for men, with lower income predicting greater change after CRE participation. Additionally, race was predictive of unique variance in baseline individual functioning: African Americans in the study reported higher levels of pre-program individual functioning. Marital status and attendance status predicted unique variance in relational functioning. Married men reported greater positive change in relationship confidence. Further, attending with a partner (for both men and women) was predictive of greater improvements in couple functioning and relationship confidence.

Other researchers have considered the experiences of distressed or disadvantaged individuals and couples in CRE (e.g., Carlson et al., 2017; McGill et al., 2016). McGill and colleagues (2016) used a sample of 379 couples (758 individuals) to assess whether relational instability at baseline influenced changes in individual and relational functioning following CRE participation. Findings show that women who came in with higher levels of relational instability reported a greater positive change in depressive symptoms. Further, baseline levels of relational instability moderated the change in women's couple quality. Women reported more positive changes in relationship quality when they had higher instability and higher relationship quality at baseline, and when their partners reported higher instability and lower quality at baseline. Similarly, Carlson and colleagues (2017) tested whether baseline levels of relationship and/or

individual distress would moderate the effectiveness of relationship education (RE) in two primarily low-income and ethnically diverse samples, one receiving couple-oriented relationship education and one receiving individual-oriented relationship education (i.e., participants predominantly attended singly and the curriculum focused on relationship skill-building). Overall, individual distress at baseline did not moderate the effectiveness of the individual-oriented RE program, and all participants who attended the individual-oriented relationship education program reported significant decreases in individual distress from pre- to post-intervention. For women in the couple-oriented RE program, relationship distress was found to moderate relational functioning, such that women with higher levels of relationship distress at the start of the program experienced the greatest improvements following the intervention.

In studies of moderators of CRE program effects, only five studies have explicitly assessed for and considered ACEs and their potential influence on individual and relational functioning among CRE participants (Cooper et al., 2019; Cooper et al., 2020; Cooper et al., 2021; Wheeler et al., 2019; Wheeler et al., 2020). Wheeler and colleagues (2019) used a sample of 96 individuals participating in an individual-oriented relationship education program (i.e., attending relationship skills training individually, whether single or in a couple relationship) to assess the baseline associations between ACEs and health, while considering relationship distress. They discovered that number of ACEs was related to physical and mental health, with this link moderated by relationship distress. More specifically, the predictive relationship between ACEs and health was strengthened by relationship distress, and almost half (42%) of the variance in physical and mental health was accounted for by ACEs and relationship distress (Wheeler et al., 2019). In a more recent study examining change over time, Wheeler and colleagues (2020) investigated the influence of ACEs on individual functioning *following*

participation in an individual-oriented relationship education (RE) program, seeking to understand the moderators of individual-oriented relationship education using a racially diverse sample of 223 adults. More specifically, they looked at how ACEs influenced changes in distress for participants in an individual-oriented RE intervention. Over one-third (36%) of the participants reported 4 or more ACEs with an average ACEs score of 2.93. Findings indicated that ACEs did act as a significant moderator when looking at the effect of individual-oriented RE on individual distress. In fact, those with 4 or more ACEs came in with the highest levels of individual distress pre-intervention and saw the largest reduction in distress post-intervention.

Using an economically and racially diverse sample of 1,194 individuals attending a CRE program together as a couple, Cooper and colleagues (2019) examined the prevalence of ACEs and whether and how they were associated with baseline levels of relationship quality. About two-thirds of participants (66%) reported having at least one ACE out of ten, and one in five (20%) reported 4 or more ACEs. The findings revealed a negative association between ACEs and relationship quality, indicating the importance of screening for ACEs prior to CRE participation (Cooper et al., 2019). Expanding on these findings, Cooper and colleagues (2020; 2021) recently explored whether and how ACEs influence changes in couple functioning following CRE participation. Of the program participants ($N = 793$), those with 4 or more ACEs showed greater improvements in relationship functioning following the program than those reporting less ACEs. In a comparative model, the association between ACEs and change in relationship functioning was no longer significant. Self-reported relationship self-efficacy was the stronger predictor of improvements in individuals' reported relationship quality. Similar to Wheeler's (2020) findings, these results indicate that CRE programs do not appear to exacerbate

distress for those with higher ACEs and may in fact promote greater improvements for distressed or disadvantaged individuals.

CRE and Development

Since relationship strain is found to increase over time in adulthood (Umberson et al., 2014), one might contemplate whether age plays a role in individual and couple functioning following CRE; however, limited attention has been given to age as a predictive variable in studies of CRE. Recently, much more attention has been placed on emerging adults, including in the CRE literature (e.g., Bradford et al., 2016; Cottle et al., 2014). Previous CRE studies have placed a large focus on newly married or engaged couples, who may be “blinded” by new love and create a “ceiling effect” by reporting higher relationship satisfaction at program start, thus leaving less room for improvement (Schofield et al., 2015). However, a number of studies reveal significant gains in positive attitudes, relationship skill knowledge, and communication skills for college students and young couples after participating in RE programs (e.g., Bradford et al., 2016; Cottle et al., 2014; Doherty et al., 2003). Bradford and colleagues (2016) provided premarital education to 682 young adults from the community (74% female, 85% White) and compared outcomes to a group of 462 university students (70% female, 92% White) who did not receive any form of intervention. Overall, the treatment group saw significant increases in scores from pre to post across all four outcomes (perceived knowledge about relationship skills, perceived knowledge about partner selection, perceived knowledge about a potential partner’s relational patterns, perceived knowledge about a potential partner’s relationship behaviors and attitudes). Similarly, another study evaluated the effectiveness of RE with 186 emerging adults (61% female, 72% White) who were single or early in dating relationships and found significant positive increases in all four relational outcomes (attitudes, knowledge, communication skills,

and relationship characteristics). The researchers point out that the motivation for serving this population comes from the desire of family life educators to address problems before dysfunction develops, and even before committed, intimate relationships transpire (Cottle et al., 2014). Additionally, the concepts and skills taught in RE programs (e.g., healthy communication patterns, decision-making skills) are said to be particularly relevant for young adults, who are in a life stage that is largely focused on developing healthy relationships (Vennum et al., 2017). Hawkins and colleagues (2004), however, assert that individuals in each life stage have the potential to benefit from RE programs—including adolescents who are focused on developing relationships and forming attitudes and skills, individuals in middle adulthood who may be facing relationship challenges due to increasing work and family demands, and those in post-retirement who may have their relationship skills challenged by health issues that arise (Hawkins et al., 2004).

Although CRE has shown promising outcomes for young adults (e.g., Bradford et al., 2016; Cottle et al., 2014), less is known about how CRE influences participants of different age groups. Only recently have there been discoveries about the influence of life stage and relationship length on outcomes following CRE (Crapo et al., 2020; McGill et al., 2021). Crapo and colleagues (2020) conducted a recent study to see whether the changing needs that occur throughout different family life stages affect relational functioning after participation in a CRE program. Out of 971 participants, 87% were married, 58% were female, and 84% were Caucasian. The family life stages included: establishment (early marriage/no children), transition to parenthood (oldest child under 2), preschool (oldest child between 2 and 5), school-age (oldest child between 5 and 12), teenage (oldest child between 12 and 18), and adult (oldest child 18 and older). Ultimately, participants in the earlier stages (establishment, transition to parenthood, and

preschool) did not show increases in relational functioning the same way that other stages did. In fact, traditional families in the transition to parenthood stage showed decreases in knowledge and commitment post-program. This study indicates that life stage may be an important facet to consider as couples begin and participate in CRE programs.

More recently, McGill and colleagues (2021) assessed the effects of CRE on several indicators of individual and couple functioning, and specifically considered the role of income, family harmony, and relationship length. In a diverse sample of 300 participants (55% female, 60% European American, 27% African American, 72% married), relationship length ranged from half a year to 57.5 years, with an average relationship length of 10 years. Overall and somewhat similar to Crapo and colleagues' study, results indicated that individuals in longer relationships experienced more positive change in conflict management skills and couple quality. Further, relationship length was significantly correlated to age, indicating that it was older individuals who saw greater changes in couple functioning.

Although current samples of CRE participants have been diverse in age (e.g., Stanley et al., 2020; Adler-Baeder et al., in press), no study of CRE has specifically considered the influence of age on program effects. Additionally, no study of ACEs has considered current age of the respondent or tested whether proximity to ACEs influences outcomes. Since ACEs are events that occur under the age of 18, making young adults most proximal to these events, they might experience an increased vulnerability to the risks associated with ACEs (Logan-Greene et al., 2014), and may be comparatively less likely to improve following an intervention. However, since relationships are newer and individuals have had less time to accumulate more adverse experiences and/or develop individual and relationship dysfunction, young adulthood might be a good time to provide CRE (Cottle et al., 2014). It may be that the potential accumulative of

traumatic and negative events and outcomes may mean less CRE program effectiveness for older adults with higher ACEs.

Theoretical Assumptions

To inform the current study, assumptions were drawn from three complementary perspectives-- a cumulative risk model, a risk and resiliency perspective, and a developmental perspective informed by life course theory. The initial research on risk factors was largely focused on singular events, but researchers have since shifted the focus to a multiple risk exposure approach, much like what is assessed when measuring ACEs. The cumulative risk perspective is used in several studies considering ACEs (e.g., Chapman et al., 2004; Danese et al., 2009; Evan et al., 2013; Mersky et al., 2013; Umberson et al., 2005) and suggests that with each added risk factor, or ACE, one might experience worsened effects. Risk factors are individual or environmental factors that increase the likelihood of developing unfavorable outcomes. Based on the findings from the original ACEs study, and the research thereafter, each ACE can be viewed as a risk factor in that it increases the odds of negative outcomes. Additionally, much of the research using the cumulative risk model has found support for this proposed dose-response relationship, such that as the number of risk factors increase, so does the severity of the impact (e.g., Chapman et al., 2004; Danese et al., 2009; Mersky et al., 2013; Umberson et al., 2005). The research on cumulative risk has often been centered around childhood, since this is a period when many common risk factors are occurring (e.g., harsh parenting, low-quality education, etc.) and salient developmental processes are taking place. For the current study, this perspective and its empirical basis suggest that as one's ACEs score increases, we would see a decrease in mental health, an increase in perceived stress, and a decrease in relationship quality and conflict management at baseline.

The risk and resilience perspective, which focuses on the interplay of risk and protective factors in promoting resilience, originally stemmed from research on psychopathology (e.g., Garmezy & Rodnick, 1959). Researchers were studying children of mentally ill parents to determine risk factors for developing a mental disorder themselves and discovered that some of the children developed well despite the adversity they faced (Garmezy, 1973). They attributed this in part to resilience, or the patterns of positive adaptation when facing a considerable amount of risk or adversity. Resilience is not an individual trait but is often manifested through one's behaviors or life patterns. One way the model is used is through a variable-focused approach, in which researchers examine what variables contribute to the patterns of risk and resilience. The variable-focused approach can consist of additive models and moderating models, both of which are relevant to the current study. Additive models assume that the accumulation of more resources or key resources will benefit the individual in the face of adversity. In the current study, the concept and skills taught in CRE can be viewed as resources that serve as a protective factors and attenuate the potential negative effects of ACEs. Moderating models test for interaction effects, and place emphasis on how a specific variable might modify the impact of a risk on the outcome (Masten & Powell, 2003). For the current study, age was tested as a moderator to examine how this factor might modify the influence of ACEs on individual and relational functioning at baseline, and change in functioning over time. Masten and Powell (2003) argue that the transition to adulthood could provide an important window to increase protective factors, as it may allow the young adult to restructure their environment in ways that produce more favorable outcomes. Considering proximity to ACEs, this might not hold as true for younger CRE participants with more ACEs (i.e., assumption of more resistance to

intervention). One might also consider that CRE programs could be less effective for older adults who have had more time to accumulate trauma and experience the effects of ACEs.

Following the start of U.S. federal funding and advances in research methods in the 1960s, researchers in the social sciences field looked for approaches that would capture change over time, while also considering context (Elder, 1998). Drawing from the central tenets of multidisciplinary perspectives, life course theory gives us a “panoramic view” throughout the gathering and analysis of data. Ultimately, life course theory holds that our lives are influenced by time, culture, context, and the interdependence of relationships. Trajectories, a term coined by life course theorists refers to the continuity of roles and identities and the formation of a pathway of cumulative advantage or disadvantage. An individual’s culture, context, and relationships can also play into these pathways. Further, this theory poses that every decision one makes over the life course is dependent on and influenced by developmental history and the choices available (Allen & Henderson, 2017). Additionally, the timing of when life transitions or events occur in a person’s life influences the developmental impact of that event (Elder, 1998). For the current study, this theory suggests that ACEs may influence individuals in different ways across the lifespan, and that based on developmental trajectory, the effectiveness of a resource, such as CRE, may vary. Since this theory can account for less program effectiveness for both younger individuals with more ACEs due to proximity and for older individuals with more ACEs due to possible accumulation of negative experiences over more time, the implications for program effectiveness remains an exploratory question.

Limitations of Previous Research

Overall, ACEs have significant and deleterious impacts on individual mental health and relational functioning, such as interpersonal violence and relationship quality. The findings

emphasize the need for interventions to address the impacts of ACEs, but only five studies have considered ACEs in the context of relationship education (Cooper et al., 2019; Cooper et al., 2020; Cooper et al., 2021; Wheeler et al., 2019; Wheeler et al., 2020).

Although there is an abundance of literature on ACEs and CRE individually, there are significant limitations in each that this study sought to address. A considerable limitation of previous studies is that many do not use all of the items included in the ACEs Questionnaire (Felitti et al., 1998), or they consolidate the items into groups. For example, Danese and colleagues (2009) assessed only three domains of ACEs-- low socioeconomic status (SES), maltreatment, and social isolation. Similarly, Whitfield and colleagues (2003) measured only three ACEs-- physical abuse, sexual abuse, and witnessing domestic violence. Paradis and Boucher (2010) had participants respond to measures of childhood sexual abuse, childhood emotional abuse, and physical abuse and neglect. Much of the literature, including the original ACEs study (Felitti et al., 1998), finds substantial impacts for those who have experienced 4 or more ACEs. For example, respondents with 4 or more ACEs were twice as likely to have poor self-rated health and four times more likely to experience depression (Felitti et al., 1998). Two of the studies guiding the current study (Wheeler et al., 2020; Cooper et al., 2020) also found notable outcomes for participants who reported 4 or more ACEs. Thus, including more categories of ACEs increases the range and variability of the measure and allows for a more robust test of the dose-response phenomenon.

Furthermore, previous studies of CRE and of ACEs are limited in that they do not consider age. Although recent literature examines the links between family life stage or relationship length and CRE outcomes (Crapo et al., 2020; McGill et al., 2021) and many researchers have looked at young adults in the context of CRE and found positive improvements

(e.g., Bradford et al., 2016; Cottle et al., 2014), none have considered age as a moderator in a broader CRE population and studies of ACEs have not considered the interaction of ACEs and age on current functioning.

The Current Study

The literature clearly demonstrates that ACEs have a significant, detrimental influence on individual distress and mental health (e.g., depression and anxiety) and indicators of relational functioning, such as aggression, interpersonal problems, and relationship quality. The need for interventions to address the potential adverse effects of ACEs is suggested by many researchers, yet there has been little research on ACEs and couple-focused interventions. Although there are currently five studies that examine the relationship between ACEs and outcomes in a relationship education setting (Cooper et al., 2019; Cooper et al., 2020; Cooper et al., 2021; Wheeler et al., 2019; Wheeler et al., 2020), one assessed only individual functioning immediately after CRE; the other assessed relational functioning only at immediate post-program and neither considered the influence of age in these models.

The current study used a developmental lens and longitudinal data over six months and sought to understand how ACEs, age, and the combination of the two, impact individual and relational functioning at baseline and following a couple-based CRE intervention. Four outcomes were assessed at baseline and at the six-month follow-up: mental health, perceived stress, conflict management skills, and couple quality. Specifically, the following research questions were explored.

- a. **RQ1:** What are the associations between ACEs and age, individually and in combination and individual and couple functioning (i.e., mental health, stress, conflict management, couple quality) at CRE program start for men and women?

- b. **RQ2:** Do ACEs, age, and the interaction of ACEs and age uniquely predict change in individual and couple functioning six months after program enrollment for men and women participants in CRE?

CHAPTER III: Methods

Procedure

The current study includes CRE participants, all in a couple relationship, from a southeastern state who completed a baseline survey pre-program, a follow-up survey 6 months post-program, and a follow-up survey two-years post-program. Both surveys contained measures of individual and couple functioning, along with demographic information in the baseline survey. The ACEs score was collected on the two-year follow-up survey. Since the ACEs measure is retrospective of events occurring before the age of 18, and participants had to be 19 to be included in the study, it is still appropriate to use the responses since they reflect a specific time period. Ten sites across the state, primarily consisting of community agencies and family resource centers, recruited individuals in a couple relationship to participate in a study of the efficacy of two evidence-informed CRE programs: *ELEVATE: Taking Your Relationship to the Next Level* (Futris et al., 2014) and *Couples Connecting Mindfully* (McGill et al., 2015). Methods of recruitment included the sites' web pages, social media, flyers posted across communities, and word of mouth. After at least one partner completed the baseline survey, couples were randomly assigned by site to participate in one of three groups: a control group receiving information on community resources but no CRE, a group receiving the *ELEVATE* curriculum, and a group receiving the *Couples Connecting Mindfully* curriculum.

Both the *ELEVATE* and *Couples Connecting Mindfully (CCM)* curricula were derived from The National Extension Relationship and Marriage Education Model (NERMEM), a framework that outlines seven core principles of healthy relationships: care for self, choosing the relationship, knowing one another intimately, caring for one another, sharing interests with one another, managing conflict within the relationship, and connecting with others who are

supportive of the relationship (Futris & Adler-Baeder, 2013). *ELEVATE* (Futris et al., 2014) uses 8 modules to combine practical relationship skills with information on the physiology of human interaction and methods for reducing stress and enhancing healthy relationships. *Couples Connecting Mindfully (CCM)* (McGill et al., 2015) is an evidence-informed, 6-module curriculum focused on mindfulness-based stress reduction skills to regulate emotions and enhance healthy interactions in couple relationships. Each informational session is highly interactive and provides mindfulness exercises for couples to practice at home. Similar relational skills based on the NERMEM model are emphasized.

In the current study, a total of 1,489 respondents from the program ($n = 995$) and control groups ($n = 494$) were included for baseline analyses. Individuals in the control group were included for RQ1 since they were potential participants in CRE. This provides a larger sample of potential participants in which to assess start-points related to ACEs and age. Respondents from the control group were not utilized for RQ2. Only respondents from the program groups were used for analyses of influences on program effectiveness over time. Those who were assigned to a curriculum group had the opportunity to meet for 2 hours each week for 6 weeks at the local family resource center or community meeting center. Each class was led by two trained facilitators (male/female team) at each site. 75% of the couples randomly assigned to a program attended half or more of the sessions with an average attendance rate of 68%. Approximately 6 months, 1 year, and 2 years after program participation, study participants were provided the opportunity to complete a follow-up survey to evaluate post-program changes in individual and couple functioning. Each participant received \$50 in compensation per survey they completed (\$100 for the 2-year-follow-up survey). The baseline and the 6-month follow-up data were used for the current study, while only the ACEs score from the 2-year follow-up survey was used.

Participants

The original sample consisted of 1,858 individuals, but after removing individuals in same-sex couple relationships and individuals who did not complete the ACEs questionnaire at the two-year follow-up, the final analytic sample for RQ1 consisted of 1,489 adult individuals (52% female, 48% male). At least one partner in the couple relationship had to complete a baseline survey to be included in the study. Additionally, 19 same-sex individuals were removed from analyses since sex was used to address couple's shared variance. Of the 1,489 individuals, 92% have a partner included in the dataset (19% in a committed relationship, 9% engaged, 72% married).

Due to random assignment, one-third of the sample at baseline were assigned to *ELEVATE* participation, one-third to *Couples Connecting Mindfully*, and one-third were a part of the control group. Groups did not differ significantly from each other demographically (see Table 1). The mean participant age was 38 years, with 13% between the ages of 18 and 25. The study sample for RQ 1 was racially diverse: 61% identified as European American, 33% as African American, and 6% as another racial/ethnic category (e.g., Asian American, American Indian/Alaska Native, etc.). Regarding level of education, 4% of respondents had no diploma or degree, 18% held a high school diploma or GED, 20% percent had completed some college but no degree completion, 13% held an associate's degree or a vocation/technical certification, and 45% held a bachelor's degree or higher. The sample was diverse in income: 24% reported a household income of less than \$25,000, 46% reported between \$25,000 and \$75,000, and 30% reported above \$75,000. The analytic subsample ($n = 995$) for RQ 2 (i.e., only those assigned to a program group) is two-thirds of the full study sample and as noted, is representative of the full study sample. Differences between groups were not found for age ($t = -.756, p = .450$), sex ($\chi^2 =$

.003, $p = .956$), race/ethnicity ($\chi^2 = .940$, $p = .967$), income ($\chi^2 = 2.295$, $p = .891$), and education ($\chi^2 = 1.507$, $p = .982$) (see Table 1).

Measures

Items included in the following measures are displayed in the Appendix, followed by the descriptive statistics of each measure at baseline (Table 2) and 6-month follow-up (Table 3). Methods for handling missing are described in the Analytic Plan section.

Age. At baseline, respondents wrote in an answer to the following question: “What is your age in years?”

Adverse Childhood Experiences (ACEs). Adverse childhood experiences (ACEs) were measured using the ACEs Questionnaire (Felitti et al., 1998). The current scale consists of 10 items reflecting the seven original categories measured in the original ACEs study in addition to physical and emotional neglect and parental divorce. The items asked about the participants’ exposure to certain adversities in the first 18 years of life, specifically related to abuse, neglect, and household dysfunction. Example items include, “Did a parent or other adult in the household often swear at you, insult you, put you down, or humiliate you? Or act in a way that made you afraid that you might be physically hurt?” and “Did you often feel that you didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you? Or your parents were too drunk or high to take care of you or take you to the doctor if you needed it?” Participants answered (0) “no” or (1) “yes” to indicate exposure and scores range from 0-10. As in previous studies, responses were added together to create a sum ACEs score. All 10 items required a “yes” or “no” response to be included in the sum ACEs score.

Mental Health. To examine mental health, the SF-12 Mental Health Component Summary score (Ware et al., 1996) obtained from the SF-12 Health Survey (Ware & Gandek,

1998) was used. The SF-12 has precise coding instructions, which entails standardizing items, summing items, and standardizing sum scores (Maruish, 2012). Scores range from 0 to 100 ($M = 50$, $SD = 10$) in the general U.S. population, with higher values indicating better individual mental health (Gandek et al., 1998; Ware et al., 1996). Example items include, “How much of the time in the past month have you felt downhearted and depressed?” and “How much of the time in the past month did you have a lot of energy?” Some scales range from 1 to 5, others range from 1 to 3. The SF-12 Mental Health component is an empirically validated measure and has shown good reliability in previous studies (Gandek et al., 1998; Ware et al., 1996).

Perceived Stress. Perceived stress was measured using 10 items from the Perceived Stress Scale (Cohen et al., 1983). Example items include, “In the past month, how often have you felt nervous or stressed?” and “In the past month, how often have you felt difficulties were piling up so high that you could not overcome them?” Responses were on a Likert-type scale and ranged from (1) “Never” to (5) “Very often.” A sum score of the responses was calculated to create a composite score, with higher scores indicating higher perceived stress. The Cronbach’s alpha coefficient for internal consistency is $\alpha = .878$ at baseline and $\alpha = .882$ at six-month follow-up for men, and $\alpha = .893$ at baseline and $\alpha = .889$ at six-month follow-up for women, indicating good reliability.

Conflict Management. Conflict management skills were measured using 5 items from the Manage subscale of the Couple Relationship Skills Inventory (CRSI) (Adler-Baeder, et al., in press). Example items include “When things ‘get heated’ I suggest we take a break to calm down” and “I can easily forgive my partner.” Responses range from (1) “Very strongly disagree” to (7) “Very strongly agree.” A sum score of these responses was calculated to create a composite score, with higher scores indicating better conflict management. The Cronbach’s

alpha coefficient for internal consistency is $\alpha = .656$ at baseline and $\alpha = .728$ at six-month follow-up for men, and $\alpha = .711$ at baseline and $\alpha = .737$ at six-month follow-up for women, indicating acceptable reliability.

Relationship Quality. Couple quality was measured using 3 items from the Quality Marriage Index (Norton, 1983). Items include, “We have a good relationship,” “Our relationship is strong,” and “My relationship makes me happy.” Responses were on a Likert-type scale and ranged from (1) “Very strongly disagree” to (7) “Very strongly agree.” A sum score of these responses was calculated to create a composite score, with higher scores indicating higher relationship quality. The Cronbach’s alpha coefficient for internal consistency is $\alpha = .943$ at baseline and $\alpha = .971$ at six-month follow-up for men, and $\alpha = .957$ at baseline and $\alpha = .975$ at six-month follow-up for women, indicating excellent reliability.

Analytic Strategy

To address missing data in the study variables (with the exception of demographics and ACEs), imputed data were used for the analyses. Since every item on the ACEs questionnaire was required to have a “yes” or “no” response in order to be included in the sum ACEs score, there were no missing ACEs items. The average % missing of the individual and relational functioning items used in the current study was 3% at baseline (T1) for the full analytic sample and 13% at the 6-month follow-up (T3) for the program group sample. However, imputation was done on the item-level before creating composites, resulting in no missing data. Multiple imputation was conducted by predicting multiple values for each missing value based on using the raw data as covariates (e.g., site, random assignment, age, sex, income, public assistance, relationship type, parent status, number of children, etc.). This was completed using the “mice” package in R (Azur et al., 2011; van Buuren & Groothuis-Oudshoorn, 2011; R Core Team, 2020)

and resulted in multiple datasets. Pooled item values from the 20 imputed datasets were utilized in the following analyses.

In order to test RQ1 and RQ2, SPSS 24.0 was utilized to execute a series of regression models, using ACEs and age as independent variables, and each individual and couple functioning measure as dependent variables. To test RQ1, we performed a series of hierarchical linear regression models, using ACEs and age and the interaction term of ACEs and age (product of ACEs and age) as predictors of the individual and couple functioning measures at baseline. Men and women models were run separately due to dependence in the data. In order to test RQ2, we performed a series of hierarchical linear regression models, using ACEs and age and the interaction term of ACEs and age (product of ACEs and age) as predictors of the individual and couple functioning measures at the 6-month follow-up, while controlling for baseline levels of the individual and couple measures, thus predicting residual change. Men and women models were run separately due to dependence in the data. We interpreted the magnitude and significance of the associations using the beta coefficients and corresponding *p*-values, respectively. In the case of significant interactions, we reviewed the simple slopes.

CHAPTER IV: Results

Preliminary Analyses

Descriptive statistics of all study variables across the full analytic sample and program participant sample for men and women are reported in Tables 2 and 3. The variables in the full analytic sample are normally distributed, as the kurtosis and skewness statistics fall between -2 and +2 (George & Mallery, 2010). Before conducting hierarchical linear regression (HLR), correlations were run in order to examine bivariate relationships between the study variables (see Tables 4 and 5). In the full analytic sample, significant correlations ranged from -.17 to .22. For men and women, no significant bivariate relationships were found between age and baseline conflict management skills, and age and baseline couple quality. These paths were not included in the regression analyses addressing Research Question 1. In the program participant subsample, significant correlations ranged from -.16 to .18. No significant bivariate relationships were found between ACEs and Time 3 conflict management skills for women, and age and Time 3 mental health for men. For both men and women, no significant bivariate relationships were found between age and Time 3 conflict management skills, and age and Time 3 couple quality. These paths were retained in the models since the analyses account for baseline levels of the outcomes, thus the predictive path is to the residual change in each outcome.

Research Question 1 – Baseline Associations between ACEs, Age, the Interaction of ACEs and Age, and Individual and Couple Outcomes

Research Question 1 explored the associations between ACEs and age, and individual and couple outcomes, individually and in combination at CRE program start. Each individual outcome (mental health, perceived stress) at baseline (T1) was regressed onto ACEs and age at Step 1, and onto the interaction of ACEs and age at Step 2. For the couple outcomes, based on

results from preliminary correlations indicating no significant linear relationship between age and baseline conflict management skills, and age and baseline couple quality, each couple outcome at baseline (T1) was regressed only onto ACEs at Step 1, and onto the interaction of ACEs and age at Step 2. Results are described in detail below and all parameter estimates from the analyses are displayed in Tables 6-9.

Mental Health. For men, in Model 1, the additive model, both ACEs [$\beta = -.161, p < .001$] and age [$\beta = .109, p = .004$] significantly and uniquely predicted mental health at baseline. Men with a higher number of ACEs and those who were younger reported lower mental health. The link between ACEs and mental health was slightly stronger for men than the link between age and mental health. The model explained 4% of the variance in mental health at baseline for men. After adding the interaction of ACEs and age in Model 2 (moderation model), only ACEs significantly predicted mental health at baseline [$\beta = -.342, p = .011$], such that a higher number of ACEs was associated with lower mental health. The total variance explained by the model was 4.3%, explaining an additional 0.3% compared to Model 1; however, this change was not significant (R^2 change = .003, F change (1, 691) = 1.98, $p = .16$). Since adding the interaction term did not improve the model, Model 1 (additive model) was interpreted as the result. See full results in Table 6.

For women, similar to men, in Model 1 (additive model), both ACEs [$\beta = -.18, p < .001$] and age [$\beta = .177, p < .001$] significantly and uniquely predicted mental health for women at baseline. Women with a higher number of ACEs and those who were younger reported lower mental health. The model explained 6.1% of the variance in mental health at baseline for women. In Model 2, the moderation model, both age [$\beta = .253, p < .001$] and the interaction of ACEs and age [$\beta = -.306, p = .016$] significantly and uniquely predicted mental health at baseline,

accounting for number of ACEs, which was not significant. The path from the interaction of ACEs and age to mental health was comparatively stronger than the link between age and mental health. The significant interaction indicated that at baseline, older women with more ACEs reported the lowest levels of mental health compared to younger women with more ACEs (next lowest), and younger and older women with fewer ACEs (see Figure 1). The total variance explained by the model was 6.8%, explaining an additional 0.7% compared to Model 1. This change was significant (R^2 change = .007, F change (1, 767) = 5.853, $p < .05$); therefore, Model 2 (moderation model) was interpreted as the final result. See full results in Table 6.

Perceived Stress. For men, in Model 1, the additive model, both ACEs [$\beta = .209$, $p < .001$] and age [$\beta = -.078$, $p = .037$] significantly and uniquely predicted perceived stress for men at baseline. Men with a higher number of ACEs and those who were younger reported higher levels of perceived stress. The link between ACEs and stress level was comparatively stronger than the link between age and stress level. The model explained 5.2% of the variance in perceived stress at baseline. After adding the interaction of ACEs and age in Model 2 (moderation model), only age significantly predicted perceived stress at baseline [$\beta = -.089$, $p = .044$], such that men who were younger reported higher levels of perceived stress. The total variance explained by the model was also 5.2%, and the change from Model 1 was not significant (R^2 change = .0003, F change (1, 691) = 0.231, $p = .631$). Since adding the interaction term did not improve the model, Model 1 (additive model) was interpreted as the result. See full results in Table 7.

For women, similar to men, in Model 1 (additive model), both ACEs [$\beta = .213$, $p < .001$] and age [$\beta = -.138$, $p < .001$] significantly and uniquely predicted perceived stress for women at baseline. Women with a higher number of ACEs and those who were younger reported higher

levels of perceived stress. The model explained 6.2% of the variance in perceived stress at baseline. In Model 2 (moderation model), when the interaction term was entered, both age [$\beta = -.205, p < .001$] and the interaction of ACEs and age [$\beta = .272, p = .032$] significantly predicted perceived stress at baseline. The path from the interaction of ACEs and age to perceived stress was comparatively stronger than the link between age and stress level. The significant interaction indicated that at baseline, older women with more ACEs report higher stress compared to younger women with more ACEs. Both groups, however, reported higher perceived stress at baseline than younger and older women with fewer ACEs (see Figure 2). The total variance explained by the model was 6.8%, explaining an additional 0.6% compared to Model 1. This change was significant (R^2 change = .006, F change (1, 767) = 4.625, $p < .05$); therefore, Model 2 (moderation model) was interpreted as the final result. See full results in Table 7.

Conflict Management Skills. For men, in Model 1, the additive model, ACEs [$\beta = -.12, p = .002$] significantly predicted conflict management skills for men at baseline. Men with a higher number of ACEs reported lower levels of conflict management skills. The model explained 1.4% of the variance in conflict management skills at baseline. In Model 2 (moderation model), when the interaction of age and ACEs was added to the model, no significant associations were found. The total variance explained by the model was 1.6%, explaining an additional 0.2% compared to Model 1; however, this change was not significant (R^2 change = .002, F change (1, 697) = 1.371, $p = .242$). Since adding the interaction term did not improve the model, Model 1 (additive model) was interpreted as the result. See full results in Table 8.

For women, similar to men, in Model 1 (additive model), ACEs [$\beta = -.118, p < .001$] significantly predicted conflict management skills for women at baseline. Women with a higher

number of ACEs reported lower levels of conflict management skills. The model explained 1.4% of the variance in conflict management skills at baseline. After adding the interaction of ACEs and age in Model 2 (moderation model), only ACEs significantly predicted conflict management skills at baseline [$\beta = -.223, p = .022$], such that a higher number of ACEs was associated with lower levels of conflict management skills. The total variance explained by the model was 1.6%, explaining an additional 0.2% compared to Model 1; however, this change was not significant (R^2 change = .002, F change (1, 769) = 1.346, $p = .246$). Since adding the interaction term did not improve the model, Model 1 (additive model) was interpreted as the result. See full results in Table 8.

Couple Quality. For men, in Model 1, the additive model, ACEs [$\beta = -.127, p < .001$] significantly predicted couple quality for men at baseline. Men with a higher number of ACEs reported lower couple quality. The model explained 1.6% of the variance in couple quality at baseline. After adding the interaction of ACEs and age in Model 2 (moderation model), no significant associations were found. The total variance explained by the model was 1.6%, and the change from Model 1 was not significant (R^2 change = .000002, F change (1, 697) = 0.002, $p = .967$). Since adding the interaction term did not improve the model, Model 1 (additive model) was interpreted as the result. See full results in Table 9.

For women, similar to men, in Model 1 (additive model), ACEs [$\beta = -.131, p < .001$] significantly predicted couple quality for women at baseline. Women with a higher number of ACEs reported lower couple quality. The model explained 1.7% of the variance in couple quality at baseline. In Model 2 (moderation model), when the interaction of age and ACEs was added to the model, no significant associations were found. The total variance explained by the model was 1.7%, and the change from Model 1 was not significant (R^2 change = .0002, F change (1, 769) =

0.17, $p = .68$). Since adding the interaction term did not improve the model, Model 1 (additive model) was interpreted as the result. See full results in Table 9.

Research Question 2 – Effects of ACEs, Age, and the Interaction of ACEs and Age on Residual Change in Individual and Couple Outcomes

Research Question 2 explored whether ACEs and age and their interaction predicted change in individual and couple outcomes six-months post-program. After entering the baseline (T1) level of each outcome in Step 1, each individual and couple outcome at six months post-program (T3) was regressed onto ACEs and age in Step 2. The interaction term for age and ACEs was entered as a predictor in Step 3. Results are described in detail below and all parameter estimates from the analyses are presented in Tables 10-13.

Mental Health. For men, in Model 2, the additive model, neither ACEs nor age significantly predicted change in mental health at the six-month follow-up. After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor the interaction of ACEs and age significantly predicted change in mental health at the six-month follow-up, indicating all participants improved similarly. See full results in Table 10.

For women, in Model 2 (additive model), ACEs [$\beta = -.100, p = .007$] and age [$\beta = .079, p = .035$] each had a significant and unique effect on change in mental health. Women with a higher number of ACEs and those who were younger reported less improvement in mental health. The predictive path between ACEs and improvement in mental health was slightly stronger than the predictive path between age and improvement in mental health. The total variance explained by the model was 32.1%, explaining an additional 1.4% compared to Model 1. This change was significant (R^2 change = .014, F change (2, 513) = 5.463, $p < .01$). After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor

the interaction of ACEs and age significantly predicted change in mental health at the six-month follow-up. The total variance explained by the model was 32.1%, and the change from Model 2 to Model 3 was not significant (R^2 change = .0002, F change (1, 512) = 0.145, p = .703). Since adding the interaction term did not improve the model, Model 2 (additive model) was interpreted as the result. See full results in Table 10.

Perceived Stress. For men, in Model 2, the additive model, neither ACEs nor age significantly predicted change in perceived stress at the six-month follow-up. After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor the interaction of ACEs and age significantly predicted change in perceived stress at the six-month follow-up. See full results in Table 11.

For women, in Model 2 (additive model), age significantly predicted change in perceived stress at the six-month follow-up [β = -.087, p = .015]. Women who were younger reported less improvement in perceived stress. The total variance explained by the model was 35.3%, explaining an additional 1.1% compared to Model 1. This change was significant (R^2 change = .011, F change (2, 513) = 4.337, p < .05). After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor the interaction of ACEs and age significantly predicted change in perceived stress at the six-month follow-up. The total variance explained by the model was 35.3%, and the change from Model 2 to Model 3 was not significant (R^2 change = .0003, F change (1, 512) = 0.285, p = .594). Since adding the interaction term did not improve the model, Model 2 (additive model) was interpreted as the result. See full results in Table 11.

Conflict Management Skills. For men, in Model 2, the additive model, neither ACEs nor age significantly predicted change in conflict management skills at the six-month follow-up. After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs,

age, nor the interaction of ACEs and age significantly predicted change in conflict management skills at the six-month follow-up for men, indicating all men improved similarly. See full results in Table 12.

For women, in Model 2, the additive model, neither ACEs nor age significantly predicted change in conflict management skills at the six-month follow-up. After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor the interaction of ACEs and age significantly predicted change in conflict management skills at the six-month follow-up for women, indicating all women improved similarly. See full results in Table 12.

Couple Quality. For men, in Model 2, the additive model, neither ACEs nor age significantly predicted change in couple quality at the six-month follow-up. After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor the interaction of ACEs and age significantly predicted change in couple quality at the six-month follow-up for men, indicating all men improved similarly. See full results in Table 13.

For women, in Model 2, the additive model, neither ACEs nor age significantly predicted change in couple quality at the six-month follow-up. After adding the interaction of ACEs and age in Model 3 (moderation model), neither ACEs, age, nor the interaction of ACEs and age significantly predicted change in couple quality at the six-month follow-up for women, indicating all women improved similarly. See full results in Table 13.

CHAPTER V: Discussion

Despite the increasing numbers of distressed individuals attending couple relationship education (CRE) (e.g., Amato, 2014; DeMaria, 2005), only a handful of studies have considered the role of ACEs in the context of CRE experiences (Cooper et al., 2019; Cooper et al., 2020; Cooper et al., 2021; Wheeler et al., 2019; Wheeler et al., 2020). The goal of the current study was to examine whether and how childhood adversity, specifically ACEs, are related to individual and relational well-being at baseline for individuals enrolled as a couple in a CRE study. In addition, because the curricula, *ELEVATE* and *Couples Connecting Mindfully (CCM)*, have demonstrated efficacy in the promotion of mental health and couple functioning when compared with a control condition (Adler-Baeder, et al., in press), we also explored whether ACEs influence the amount of improvement in individual and couple functioning across time for CRE program participants. The study was novel in that it also utilized a developmental perspective and considered the role of age and the combination of ACEs and age, in relation to well-being at the start of and following CRE participation. Taking into account an individual's background and experiences informs the CRE research base and allows practitioners to better serve CRE participants and continually enhance programs going forward.

Direct Associations between ACEs, Age, and Indicators of Individual and Relational Well-Being at CRE Program Start

Consistent with the robust findings linking ACEs to negative outcomes (e.g., Crandall et al., 2019; Crouch et al., 2018; Ferraro et al., 2016; Walker et al., 2009; Zielinski, 2009), we found that in a large diverse sample of adults volunteering to participate in a study on CRE, those who report more ACEs began the programs with comparatively lower levels of individual and relational well-being. These findings are consistent with the cumulative risk perspective, which

posits that individuals will be at greater risk for negative outcomes with each additional ACE (Evans et al., 2013). Our findings are also similar to the handful of CRE studies that have assessed ACEs, which find that individuals with more ACEs begin CRE with higher levels of distress and lower relationship quality (Cooper et al., 2019; Wheeler et al., 2020). The current study supports these findings with results indicating that individuals -both men and women - with more ACEs come into CRE with lower mental health, higher levels of perceived stress, and lower couple quality.

We also extend current knowledge with the discovery that individuals with more ACEs begin CRE with lower conflict management skills. Results of this study support the notion that ACEs may be an important contextual factor to consider when assessing baseline levels of individual and relational outcomes for participants; however, we also note that the amount of variance explained in the measures of stress and mental health by ACEs is small, indicating variation in these outcomes due to other factors for individuals with similar numbers of ACEs. Still, we concur with the recommendation by Cooper and colleagues (2019) to screen potential participants for ACEs prior to starting CRE programs. It may be that additional supports within the CRE program experience or supplemental to it can be offered to those reporting a trauma history or offered more universally if a larger proportion of participants report higher number of ACEs.

Beyond the limited research on ACEs and CRE, no previous studies of CRE have considered whether age influences individual and relational well-being at program start. Recent studies of CRE have considered life stage and relationship length and found greater change in relational functioning for older participants. However, at baseline, there were no statistically significant differences in individual or relational well-being based on life stage or relationship

length (Crapo et al., 2020; McGill et al., 2016). This is not quite consistent with the current study, which assessed this previously unexplored factor (age) and discovered that younger individuals in this sample came into CRE with comparatively lower levels of individual well-being. (The direct associations between age and indicators of relational well-being at baseline were not assessed based on preliminary analyses which revealed no significant bivariate relationships.) This is consistent with several findings which indicate that mental health problems are more prevalent, on average, in younger populations (e.g., Karatekin, 2018; Karatekin & Ahluwalia, 2020; Mersky et al., 2013; Schilling et al., 2007). This might be due to the fact that young adults are in a sensitive and unstable period of life, and have several significant developmental tasks underway, such as educational pursuits, romantic relationship exploration, and finding a career fit. This developmental period could make individuals more vulnerable to current and later mental health problems (Arnett, 2007; Logan-Greene et al., 2014).

The high rates of mental health problems among young adults may also be due to the comparatively high rates of adversity found within the current population of young adults. Researchers discovered that individuals between the ages of 25 and 34 reported more ACEs than any other age group, followed by individuals between the ages of 18 and 24 (Giano et al., 2020). In the current sample, individuals between the ages of 35 and 44 reported more ACEs than any other age group. A statistically significant difference was found between this group and individuals above the age of 64 ($F(5, 1460) = 3.029, p < .05$), who reported the lowest number of ACEs, which could account for our finding that comparatively younger individuals reported more distress and mental health challenges at baseline. Although the groups with the highest number of ACEs differ slightly between our sample and that of Giano and colleagues (2020), they also found that those above the age of 64 reported the lowest number of ACEs.

Life course theory emphasizes how the timing of life events can influence the developmental impact of those events (Elder, 1998). Therefore, it stands to reason that it might be important to examine the combination of ACEs and age on outcomes, since more proximal negative experiences may be more influential on an individual's current state. It may also be that older individuals with higher ACEs may have more current challenges, since the cumulative effects of ACEs may continue over the lifecourse.

Interaction Effects of ACEs and Age on Mental Health and Perceived Stress at CRE

Program Start

After examining how the combination of ACEs and age influence well-being at baseline, the interaction models revealed that older women with more ACEs had comparatively worse levels of mental health and reported stress at baseline compared to younger women with more ACEs and younger and older women with lower ACEs. This is in contrast to suggestions that ACEs increase a younger individual's vulnerability to current negative effects due to the timing (i.e., proximity) of these negative events (Logan-Greene et al., 2014).

As noted in our set-up of the exploratory question, there is also rationale from lifecourse theory and a risk and resiliency cumulative model as to why older women with higher ACEs might have come into CRE with reporting the lowest individual functioning. First, older individuals have had more time to experience adverse events throughout adulthood, and adversity in childhood has been linked to a number of adverse events in adulthood. For example, individuals with more ACEs are more likely to be victims of IPV (e.g., Cprek et al., 2020; Swopes et al., 2013; Whitfield et al., 2003), more likely to be diagnosed with a substance use disorder (e.g., Leza et al., 2021), and more likely to experience incarceration (e.g., Roos et al., 2016) as adults. The cumulative risk perspective states that with each added negative event, the

risk for negative outcomes increases (Evans et al., 2013), and in much of the research on ACEs, this is especially true for women. For example, women with a higher ACEs score are more likely to develop depressive disorders and experience intimate partner violence (e.g., Chapman et al., 2004; Montalvo-Liendo et al., 2015). Therefore, older women might experience worse mental health and higher stress due to the buildup of negative events over their life course, both internal to the family and external. Similar to ACEs, events could include abuse, household dysfunction, and more—including societal stressors such as discrimination. The U.S. has made major social and political advancements regarding gender and racial discrimination over the course of older individuals' lives as indicated by critical policy changes. Examples include initiatives to absolve gender-based discriminatory wage practices (Lilly Ledbetter Fair Pay Act, 2009) and race-based discrimination (Voting Rights Act, 1965). Based on this, for example, we might assume that older women have faced more discrimination based on sex compared to younger women, and older women of color have experienced more racial discrimination than younger generations.

The U.S. has also advanced in regard to mental health care; for example, by mandating that health insurance issuers with mental health coverage provide equal benefits for mental health/substance abuse care and medical/surgical care (Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act, 2008). Thus, the differences in mental health might be due to the financial barriers to mental health care previously faced by older women. Also, as society has progressed, the stigma around mental health issues has decreased, which has made it easier to openly discuss mental health issues and seek out help (Crowe et al., 2016; Lipson et al., 2017). Although older adults and women have more favorable attitudes about help-seeking (Clement et al., 2015; Kessler et al., 2015; Mackenzie et al., 2006; Mackenzie et al., 2008), they may not have had as many opportunities to do so compared to younger individuals,

who have grown up with access to online mental health resources, including online forums, mental health chatlines, and even online therapy (Burns et al. 2010). Our survey did not include items pertaining to adverse and traumatic experiences in adulthood, so this is reasoned speculation given socio-historical context.

Change in Individual and Relational Well-Being Across Time

Although ACEs and age influence baseline individual and relational well-being, the current study finds only limited evidence that these factors affect the potential benefits of the CRE program. This is a promising finding as it indicates that for most outcomes, participants with more ACEs, and younger participants, are not impacted differently by CRE. Based on a prevention science approach (Coie et al., 1993) and literature linking CRE, particularly these two curricula using the same overall sample as the current study, to established benefits and efficacy for the average participant (Adler-Baeder et al., in press), one would expect CRE to enhance individual and relational well-being. Previous literature has linked CRE to improvements in individual mental health (e.g., Adler-Baeder et al., in press; Wheeler et al., 2020); however, we found that individual well-being (i.e., mental health and perceived stress), compared to relational well-being, may be more resistant to change due to ACEs history and age. Women in our sample with more ACEs experienced comparatively less change in mental health, and younger women experienced comparatively less change in mental health and perceived stress 6 months after CRE participation. Shifts, on average were still in the direction of improvement; however, validating that those with higher ACEs and younger women were not worsening. In addition, these factors, although significantly related to change, accounted for very little of the variance in change in mental health and stress at six months post-program.

Although not assessed in this study, it would be helpful to compare in future work growth trajectories between those with higher ACEs and younger participants in programs and those in the control group. A great deal of research links childhood adversity (e.g., Karatekin, 2018; Karatekin & Ahluwalia, 2020; Mersky et al., 2013; Schilling et al., 2007) with worsened mental health and higher stress. The finding is consistent for younger individuals as well due to unique challenges in this developmental period, including identity, career, and romantic relationship exploration (Arnett, 2007). In general, younger individuals report higher levels of mental health issues (e.g., Karatekin, 2018; Karatekin & Ahluwalia, 2020; Mersky et al., 2013; Schilling et al., 2007). As noted previously, this also could be related to the higher levels of ACEs reported by this age group (Giano et al., 2020), although in the current study, those between the ages of 35 and 44 report the highest number of ACEs. Twenge and colleagues (2019) suggest that the significant increase in mental health issues in young adults over the past decade may be linked to the increase in digital media use, which can affect sleep patterns, social interaction, communication, and more. Due to the increasing rates of mental health challenges among young adults, many researchers have suggested early intervention, which may be particularly important for young adults with a history of childhood adversity, in order to buffer or even deter the negative impacts of adverse events (Karatekin, 2018; Karatekin & Ahluwalia, 2020; Mersky et al., 2013; Schilling et al., 2007). Recent studies of CRE have examined life stage and relationship length and find greater changes in relational functioning for those in later life stages and those with longer relationships (i.e., older participants), but no significant differences are found when examining change in individual functioning (Crapo et al., 2020; McGill et al., 2021). This is not consistent with the current study, which finds that change in individual functioning is impacted by age, with those who are younger seeing less improvement in mental health and

perceived stress. It may be that very little or no change over time after CRE program participation may be a positive program effect for those with higher ACEs and younger participants if compared to a negative trajectory under normative conditions.

Indications are that adding additional information and linking participants to other helpful resources is warranted for all CRE participants, particularly those with a trauma history and those who are younger. It is important to consider also that our findings may not be comparable to other CRE programs that do not include an emphasis on self-care. Both programs included in the current study-- *ELEVATE* (Futris et al., 2014) and *Couples Connecting Mindfully (CCM)* (McGill et al., 2015) teach skills to regulate emotions and reduce stress. Other CRE program predominantly focus solely on couple relational skills (Stanley et al., 2020). It would seem best that both *ELEVATE* and *CCM*, as well as other CRE programs include more content focused on improving mental health in order to enhance individual well-being, as this has implications for couple functioning (e.g., Sharabi et al., 2016). Other suggestions for program educators include referring participants to mental health resources, providing case management services, and being trained in trauma-informed care to further attenuate potential negative trajectories. In addition, added measures may be needed to specifically target younger participants for recruitment. Unfortunately, young adults are less likely to participate in programs and interventions (e.g., therapy, workshops, group-based interventions; Arnett, 2007), and less likely to find them helpful as their number of ACEs increase (Karatekin, 2019). Practitioners can prioritize recruiting more young adults into programs and interventions, and incorporating more content focused on enhancing mental health, as this will be relevant to the challenges faced by many young adults.

Gender Differences. Although comparisons were not directly tested, it appears that another key takeaway from the current study is that overall, the patterns of associations between ACEs, age, and individual and relational functioning at baseline are similar for men and women. Both men and women with more ACEs reported lower mental health, higher perceived stress, lower conflict management skills, and lower couple quality at baseline. Additionally, both men and women who were younger reported lower mental health and higher perceived stress at baseline. This is in contrast with previous research which shows that women with more ACEs are more vulnerable to negative outcomes (e.g., Chapman et al., 2004; Montalvo-Liendo et al., 2015). However, when examining change over time, it appears that women's individual well-being is more impacted by ACEs and age. Our preliminary descriptive statistics reveal that women had a higher mean ACEs score ($t(993) = -3.004, p < .01$), a higher mean perceived stress score ($t(993) = -4.71, p < .001$), and a lower mean mental health score ($t(993) = 4.2, p < .001$) than men at baseline. This indicates that men's individual well-being could have been less impacted by ACEs, age, and their interaction, because they start off with better mental health and lower perceived stress compared to women, and therefore have less room for change. Also, women report higher ACEs, which is consistently linked to mental health issues (e.g., Chapman et al., Danese et al., 2009; Karatekin, 2018; Karatekin & Ahluwalia, 2020; Mersky et al., 2013).

A number of studies find support for a stronger link between women and worse mental health, and specifically, internalizing disorders (i.e., mood and anxiety disorders) (e.g., Boyd et al., 2015; Gove, 1984; Seedat et al., 2009). Gender differences could be due to a number of reasons, including but not limited to-- hormonal differences, experiencing violence, gender inequality, caregiving, and motherhood (Bauman et al., 2020; MacDonald et al., 2005; Riecher-Rössler, 2017). Women's increased vulnerability to mental disorders may be due to the higher

frequency of fluctuations in sex hormones, which can influence cognition and behavioral processes. Women also experience more violence and gender discrimination, which can lead to higher stress and poorer mental health (Riecher-Rössler, 2017). Furthermore, research also finds that women take on more hours of unpaid work (i.e., housework, childcare, and eldercare), leading to higher levels of stress compared to men, especially for mothers who are also participating in paid work (MacDonald et al., 2005). Although women with children report higher life satisfaction than women without children (Holton et al., 2010), motherhood can also be a time of increasing mental health issues-- about 1 in 8 women report experiencing postpartum depressive symptoms (Bauman et al., 2020). As such, it may be that positive shifts in mental health may be more challenging for women due to a larger number of sources of distress compared to men that cannot easily be addressed in a CRE program.

Limitations

Although the current study has many strengths, such as the large, diverse sample size and the novel element of considering age in the context of CRE, limitations do exist. One limitation of the current study is the measurement of ACEs. Although a cumulative ACEs score may be related to risks and negative outcomes, there has been critique of this index approach to measurement (e.g., Kelly-Irving & Delpierre, 2019). We cannot assume that all ACEs hold the same weight. Also, this measure does not take into account the specific age of occurrence, intensity or chronicity/duration of ACEs, which are important factors to consider when analyzing these experiences' impact. Other scholars criticize the simplicity of the ACEs measure, and encourage the use of other measures that also assess the severity, frequency, duration, and timing of ACEs (Devaney et al., 2020; Lacey and Minnis, 2020). The current study is also limited in that all of the measures utilized were self-report, which invites bias in the data as participants

may not provide entirely true reflections about their experiences coming into and after the program. Another limitation in the measurement of ACEs is the recall factor. The process of recalling events that occurred before the age of 18 might be particularly challenging for older individuals, due to normal memory loss that comes with age; and research indicates that young adults are more likely to provide an accurate accounting of ACEs (Logan-Greene et al., 2014). Research has also documented the difficulty of recalling traumatic events, especially childhood trauma (e.g., Goodman et al., 2019; Majer et al., 2010). Brown and colleagues (2007) found a graded relationship between ACEs and childhood autobiographical memory disturbance (CAMD), such that the prevalence of CAMD increased for men and women as ACEs increased. Also, since acknowledging trauma can be uncomfortable, some participants might not feel comfortable revealing their ACEs for a non-clinical intervention, even in a confidential survey. Therefore, the ACEs scores represented might be somewhat inaccurate due to recall and reporting bias. An additional limitation of the current study is that very little of the variance in change in outcomes was explained by ACEs and age, indicating that there are various other factors to include in the models to understand how participants with ACEs histories experience change in individual and relational well-being after programming. Lastly, the study was unable to include individuals in same-sex couple relationships; therefore, the results cannot be generalized to this population.

Practical Implications and Future Directions

We expect that practitioners offering CRE programs will have interest in our findings, that indicate that ACEs and age are linked with individual and relational well-being among recruited CRE participants. We encourage screening for ACEs at the start of programming (Cooper et al., 2019); group frequencies can be shared with facilitators without compromising

confidentiality of individuals. It will also be important for practitioners to acknowledge the resiliency of individuals, and continue to provide resources that serve as protective factors and promote resilience, particularly among more vulnerable populations. Further, we recommend that program educators learn and develop skills for trauma-informed practices in order to better serve program participants, especially those coming in with a higher number of ACEs. Since individual benefits were compromised slightly for younger women and women with higher ACEs, we suggest critical assessment of CRE program content and the addition of information and skills-training relevant to enhancing individual mental health, particularly if serving a more vulnerable population.

Future studies should consider the role of ACEs and/or trauma in the context of prevention efforts, and specifically CRE, due the diverse populations of couples enrolling in these programs and the prevalence of ACEs. Additionally, the role of age or life stage in the context of CRE should be assessed further. We note that while a few CRE evaluation studies have considered ACEs, no study of youth RE has considered ACEs. It would be important to consider the role of ACEs and age in the context of youth RE programs, given that they are most proximal to the events. Gender differences should also be further explored as women with more ACEs and younger women experienced less improvements in mental health and perceived stress compared to men in the current study. We also encourage research that explores through enhanced measurement strategies the ACEs beyond a cumulative index score. It would be helpful to consider ACEs individually and compare and “weight” them. For example, common ACEs, such as divorce, may impact individuals and their relationships differently than having an incarcerated household member. It would also be useful to measure the severity and duration of ACEs, as these factors likely influence program effectiveness. There have been several

advancements regarding the ACEs measure, such as including community-level traumatic experiences (e.g., Wade Jr. et al., 2016), but it still does not consistently weight experiences or assess chronicity and intensity. Additionally, it will be important to explore the possible dyadic effects of ACEs within couple functioning, since childhood trauma is likely to influence couple relationships due to the timing of adversity, which can drastically affect how one forms and maintains attachments with other people (Hecker, 2007). Also, given the mere prevalence of ACEs, we might see that both individuals in the couple relationship have experienced at least 1 ACE.

Conclusions

The current study presents several novel findings regarding the links among childhood adversity, age, and individual and relational functioning at the start of and following CRE. The study was unique in that it considered current age of the respondent, exploring whether age and proximity to ACEs influences outcomes. Overall, ACEs and age had the biggest impact on individual outcomes; specifically, younger individuals and individuals with more ACEs reported comparatively more vulnerability at program start in both individual and relational functioning when these two factors were considered separately. When ACEs and age were combined an interesting variation emerged – older women with higher ACEs reported comparatively the worst levels of mental health and stress at program start, suggesting an accumulation of risk factors over time. In addition, women with more ACEs and who were younger experienced comparatively less benefit in indicators of individual well-being, although on average, improvements were still seen over the 6-month period. Overall, ACEs and age serve as important contextual factors that should be considered in prevention and intervention programs, and specifically in CRE.

Table 1*Demographic and Comparison Statistics of Study Participants (T1)*

	Full Analytic Sample (N = 1,489)		Program Participants (n= 995)		<i>t</i>	χ^2	<i>p</i>
	<i>N</i>	%	<i>N</i>	%			
Age (Mean)		37.64		38.01	-.756		.450
Sex							
Male	711	48	473	48		.003	.956
Female	778	52	522	52			
Race/Ethnicity							
European American	907	61	613	62		.940	.967
African American	489	33	320	32			
Other	82	6	55	6			
Education							
No diploma or degree	60	4	38	4			
High school diploma or GED	263	18	174	18			
Some college	295	20	214	22		1.507	.982
Associate's degree or vocation/technical certification	195	13	132	13			
Bachelor's degree or higher	652	45	419	43			
Income							
< \$25,000	351	24	234	24			
\$25,000-\$75,000	665	46	433	45		2.295	.891
> \$75,000	428	30	296	31			

Table 2*Descriptive Statistics of Study Variables at Baseline (T1) and ACEs at 2-year Follow-Up (T5)*

Variable	Full Analytic Sample (N = 1,489)							Program Participants (N = 995)						
	M	SD	Skewness	Kurtosis	Min	Max	Reliability	M	SD	Skewness	Kurtosis	Min	Max	Reliability
Age	38.96 36.46	12.388 11.423	.841 .865	.363 .258	18 17	90 78	-	39.47 36.7	12.799 11.709	.805 .834	.231 .152	18 18	90 78	-
ACEs	1.57 2.08	2.03 2.262	1.587 1.211	2.056 .755	0 0	9 10	-	1.61 2.01	1.986 2.221	1.518 1.203	1.804 .694	0 0	9 10	-
Mental Health	44.85 41.95	9.52 10.59	-.307 -.174	-.577 -.762	10.83 12.46	66.57 66.52	-	44.58 41.9	9.367 10.653	-.308 -.151	-.471 -.752	10.83 12.46	66.16 66.52	-
Perceived Stress	25.32 27.48	6.473 7.128	.310 .202	.442 -.192	10 11	49 50	.878 .893	25.41 27.42	6.347 7.029	.412 .301	.547 .001	10 11	49 50	.878 .89
Relationship Quality	17.5 16.91	3.395 3.873	-1.084 -1.018	1.43 .97	3 3	21 21	.943 .957	17.41 16.84	3.33 3.981	-.940 -1.034	.981 1.026	3 3	21 21	.94 .96
Conflict Management	25.06 23.11	4.525 5.011	-.058 .154	.004 -.121	7 9	35 35	.656 .711	24.85 23.22	4.658 4.907	-.104 .231	-.05 -.1	7 10	35 35	.671 .705

Note. **Bold** = women.

Table 3*Descriptive Statistics of Outcome Variables at 6-month Follow-Up (T3)*

Variable	Full Analytic Sample (N = 1,489)							Program Participants (N = 995)						
	M	SD	Skewness	Kurtosis	Min	Max	Reliability	M	SD	Skewness	Kurtosis	Min	Max	Reliability
Mental Health	45.76 43.86	9.06 9.942	-.228 -.275	-.634 -.546	19.09 12.65	65.59 62.89	-	46.25 44.16	8.988 10.085	-.343 -.283	-.389 -.683	19.09 13.94	65.59 62.89	-
Perceived Stress	24.28 25.72	6.314 6.653	.139 .069	.282 -.115	10 10	47 48	.882 .889	24.05 25.64	6.114 6.543	.21 .12	.567 -.095	10 10	47 48	.878 .886
Relationship Quality	17.69 17.34	3.221 3.602	-1.223 -1.118	2.335 1.575	3 3	21 21	.971 .975	17.7 17.46	3.166 3.514	-1.267 -1.065	2.764 1.33	3 3	21 21	.97 .976
Conflict Management	25.96 24.83	4.287 4.671	-.026 .118	-.126 -.162	11 11	35 35	.728 .737	25.92 24.89	4.254 4.594	.013 .163	-.134 -.203	11 11	35 35	.717 .737

Note. **Bold** = women.

Table 4*Correlations among Key Variables for Full Analytic Sample (N = 1,489)*

	ACEs	Age	T1 MH	T1 PSS	T1Manage	T1 QMI
ACEs	1					
	1					
Age	-.07	1				
	.04	1				
T1 MH	-.17**	.12**	1			
	-.17**	.17**	1			
T1 PSS	.22**	-.09*	-.66**	1		
	.2**	-.13**	-.7**	1		
T1 Manage	-.12**	-.01	.3**	-.4**	1	
	-.12**	.02	.34**	-.42**	1	
T1 QMI	-.13**	-.06	.36**	-.38**	.47**	1
	-.13**	-.06	.39**	-.4**	.46**	1

Note. **Bold** = women. MH = mental health, PSS = perceived stress, Manage = conflict management skills, QMI = relationship quality.

* p < .05, ** p < .01, *** p < .001

Table 5*Correlations among Key Variables for Program Participants (N = 995)*

	ACEs	Age	T1 MH	T1 PSS	T1Manage	T1 QMI	T3 MH	T3 PSS	T3Manage	T3 QMI
ACEs	1									
	1									
Age	-.1*	1								
	.03	1								
T1 MH	-.19**	.13**	1							
	-.2**	.2**	1							
T1 PSS	.23**	-.09	-.68**	1						
	.24**	-.13**	-.71**	1						
T1Manage	-.19**	-.02	.34**	-.43**	1					
	-.15**	.02	.36**	-.43**	1					
T1 QMI	-.16**	-.06	.37**	-.43**	.51**	1				
	-.15**	-.08	.39**	-.39**	.4**	1				
T3 MH	-.14**	.05	.44**	-.42**	.19**	.24**	1			
	-.2**	.18**	.55**	-.49**	.25**	.25**	1			
T3 PSS	.19**	-.11*	-.43**	.53**	-.24**	-.27**	-.65**	1		
	.2**	-.16**	-.52**	.58**	-.31**	-.24**	-.69**	1		
T3Manage	-.15**	.05	.26**	-.31**	.54**	.39**	.38**	-.49**	1	
	-.08	.02	.33**	-.35**	.61**	.3**	.35**	-.43**	1	
T3 QMI	-.14**	-.06	.27**	-.32**	.37**	.55**	.39**	-.43**	.57**	1
	-.12**	-.05	.28**	-.25**	.33**	.57**	.34**	-.28**	.52**	1

Note. **Bold** = women. MH = mental health, PSS = perceived stress, Manage = conflict management skills, QMI = relationship quality.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6*Summary of Hierarchical Regression Analysis for Variables Predicting Mental Health at**Baseline for Full Analytic Sample (N = 1,489)*

	Model 1				Model 2			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
ACEs	-0.753 -0.844	0.175 0.164	-.161*** -.18***	< .001 < .001	-1.604 0.473	0.629 0.568	-.342* .101	.011 .406
Age	0.084 0.165	0.029 0.033	.109** .177***	.004 < .001	0.058 0.235	0.034 0.044	.075 .253***	.093 < .001
ACEsxAge					0.022 -0.036	0.016 0.015	.19 -.306*	.16 .016
R^2			.04 .061				.043 .068	
F for change in R^2			14.473*** 24.957***				1.98 5.853*	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7*Summary of Hierarchical Regression Analysis for Variables Predicting Perceived Stress at**Baseline for Full Analytic Sample (N = 1,489)*

	Model 1				Model 2			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
ACEs	0.67	0.119	.209***	< .001	0.472	0.427	.148	.269
	0.672	0.11	.213***	< .001	-0.115	0.382	-.036	.764
Age	-0.041	0.02	-.078*	.037	-0.047	0.023	-.089*	.044
	-0.086	0.022	-.138***	< .001	-0.128	0.029	-.205***	< .001
ACEsxAge					0.005	0.011	.065	.631
					0.021	0.01	.272*	.032
R^2			.052				.052	
			.062				.068	
F for change in R^2			19.047***				0.231	
			25.422***				4.625*	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 8*Summary of Hierarchical Regression Analysis for Variables Predicting Conflict Management**Skills at Baseline for Full Analytic Sample (N = 1,489)*

	Model 1				Model 2			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
ACEs	-0.267	0.084	-.12**	.002	0.015	0.255	.007	.953
	-0.262	0.079	-.118***	< .001	-0.493	0.214	-.223*	.022
ACEsxAge					-0.008	0.006	-.134	.242
					0.006	0.005	.112	.246
R^2			.014				.016	
			.014				.016	
F for change in R^2			10.129**				1.371	
			10.953***				1.346	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 9*Summary of Hierarchical Regression Analysis for Variables Predicting Couple Quality at**Baseline for Full Analytic Sample (N = 1,489)*

	Model 1				Model 2			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
ACEs	-0.211	0.062	-.127***	< .001	-0.218	0.189	-.132	.25
	-0.225	0.061	-.131***	< .001	-0.161	0.165	-.094	.33
ACEsxAge					0.0002	0.005	.005	.967
					-0.002	0.004	-.04	.68
R^2			.016				.016	
			.017				.017	
F for change in R^2			11.474***				0.002	
			13.479***				0.17	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 10

Summary of Hierarchical Regression Analysis for Variables Predicting Change in Mental Health at Six-Month Follow-Up for CRE

Program Participants (N = 995)

	Model 1				Model 2				Model 3			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
T1 Mental Health	0.42	0.04	.44***	< .001	0.41	0.041	.43***	< .001	0.412	0.041	.432***	< .001
	0.524	0.035	.554***	< .001	0.491	0.036	.518***	< .001	0.489	0.036	.516***	< .001
ACEs					-0.282	0.193	-.062	.145	0.729	0.687	.161	.289
					-0.455	0.169	-.100**	.007	-0.257	0.545	-.057	.637
Age					-0.009	0.03	-.013	.768	0.021	0.036	.03	.549
					0.068	0.032	.079*	.035	0.079	0.043	.092	.066
ACEsxAge									-0.027	0.017	-.232	.126
									-0.005	0.014	-.048	.703
<i>R</i> ²			.193				.197				.201	
			.307				.321				.321	
F for change in <i>R</i> ²			110.155***				1.085				2.352	
			227.759***				5.463**				0.145	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Summary of Hierarchical Regression Analysis for Variables Predicting Change in Perceived Stress at Six-Month Follow-Up for CRE

Program Participants (N = 995)

	Model 1				Model 2				Model 3			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
T1 Perceived Stress	0.506	0.038	.532***	< .001	0.485	0.039	.51***	< .001	0.484	0.039	.509***	< .001
	0.544	0.033	.585***	< .001	0.518	0.034	.557***	< .001	0.52	0.035	.559***	< .001
ACEs					0.221	0.124	.072	.076	-0.196	0.436	-.064	.654
					0.196	0.108	.067	.069	0.371	0.344	.126	.282
Age					-0.029	0.019	-.061	.122	-0.042	0.023	-.088	.066
					-0.049	0.02	-.087*	.015	-0.039	0.027	-.07	.142
ACEsxAge									0.011	0.011	.142	.32
									-0.005	0.009	-.065	.594
<i>R</i> ²			.283				.288				.288	
			.342				.353				.353	
F for change in <i>R</i> ²			181.73***				3.015*				0.991	
			267.748***				4.337*				0.285	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 12

Summary of Hierarchical Regression Analysis for Variables Predicting Change in Conflict Management Skills at Six-Month Follow-Up for CRE Program Participants (N = 995)

	Model 1				Model 2				Model 3			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
T1 Conflict Management Skills	0.504	0.035	.553***	< .001	0.498	0.036	.546***	< .001	0.498	0.036	.546***	< .001
	0.57	0.033	.609***	< .001	0.571	0.033	.61***	< .001	0.57	0.033	.61***	< .001
ACEs					-0.083	0.085	-.039	.331	-0.194	0.302	-.09	.521
					0.017	0.073	.008	.812	0.2	0.238	.097	.402
Age					0.018	0.013	.053	.177	0.014	0.016	.043	.364
					0.002	0.014	.004	.903	0.011	0.018	.029	.535
ACEsxAge									0.003	0.008	.054	.702
									-0.005	0.006	-.097	.421
<i>R</i> ²			.305				.31				.31	
			.371				.371				.371	
F for change in <i>R</i> ²			202.227***				1.536				0.146	
			303.183***				0.037				0.648	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 13

Summary of Hierarchical Regression Analysis for Variables Predicting Change in Couple Quality at Six-Month Follow-Up for CRE

Program Participants (N = 995)

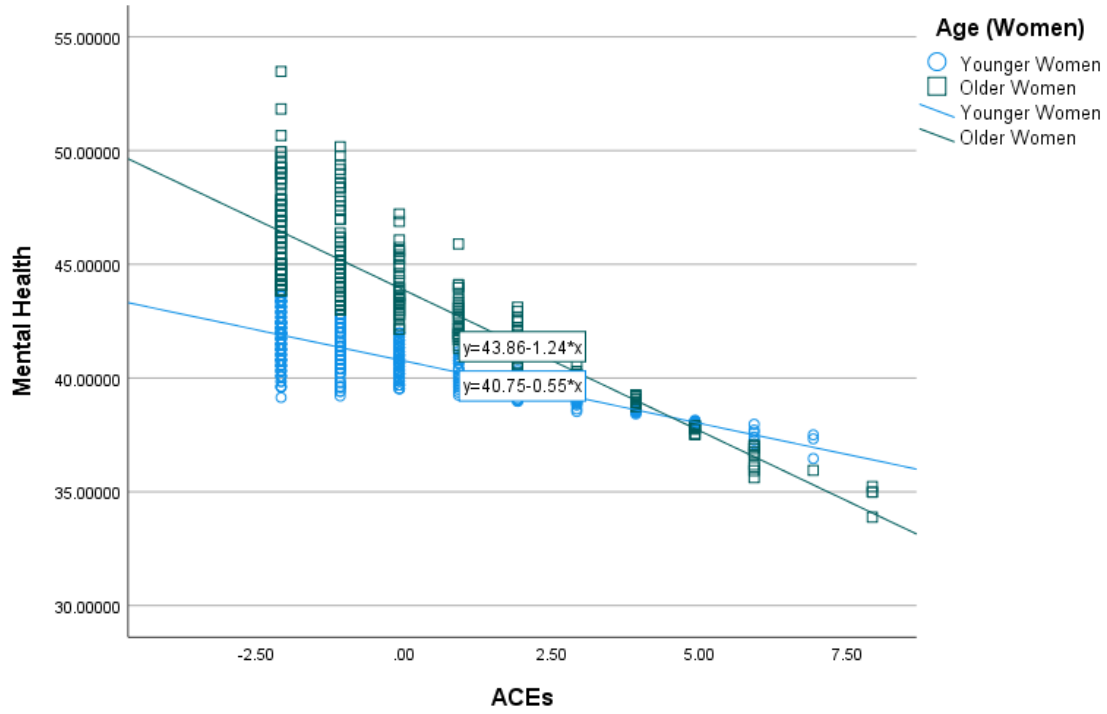
	Model 1				Model 2				Model 3			
	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
T1 Couple Quality	0.533	0.037	.558***	< .001	0.522	0.037	.547***	< .001	0.522	0.038	.547***	< .001
	0.507	0.032	.574***	< .001	0.502	0.032	.568***	< .001	0.502	0.032	.568***	< .001
ACEs					-0.094	0.063	-.059	.136	-0.09	0.225	-.056	.69
					-0.057	0.058	-.036	.327	-0.076	0.189	-.048	.689
Age					-0.007	0.01	-.027	.491	-0.007	0.012	-.026	.575
					-0.002	0.011	-.007	.839	-0.003	0.014	-.011	.824
ACEsxAge									-0.0001	0.006	-.003	.985
									0.001	0.005	.013	.917
<i>R</i> ²			.311				.315				.315	
			.33				.331				.331	
F for change in <i>R</i> ²			208.083***				1.255				0.0003	
			253.465***				0.507				0.011	

Note. ACEsxAge is the interaction between ACEs and Age. **Bold** = women.

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1

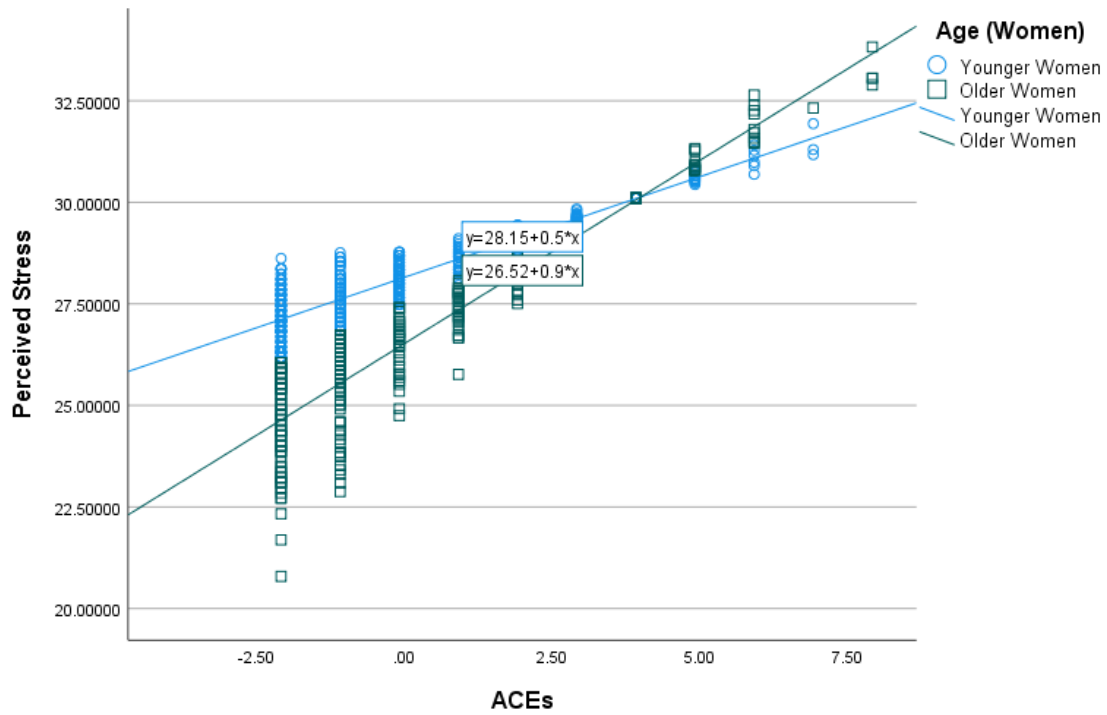
Interaction Plot for Women's Mental Health at Baseline



Note. ACEs scores are mean centered on the x-axis.

Figure 2

Interaction Plot for Women's Perceived Stress at Baseline



Note. ACEs scores are mean centered on the x-axis.

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Appendix

ACEs Questionnaire (Felitti et al., 1998)

While you were growing up, during the first 18 years of life:

aces1: Did a parent or other adult in the household often swear at you, insult you, put you down, or humiliate you? Or act in a way that made you afraid that you might be physically hurt?

aces2: Did a parent or other adult in the household often push, grab, slap, or throw something at you? Or ever hit you so hard that you had marks or were injured?

aces3: Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way? Or try to or actually have oral, anal, or vaginal sex with you?

aces4: Did you often feel that no one in your family loved you or thought you were important or special? Or your family didn't look out for each other, feel close to each other, or support each other?

aces5: Did you often feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? Or your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

aces6: Were your parents ever separated or divorced?

aces7: Was your mother or stepmother often pushed, grabbed, slapped, or had something thrown at her? Or sometimes or often kicked, bitten, hit with a fist, or hit with something hard? Or ever repeatedly hit over at least a few minutes or threatened with a gun or knife?

aces8: Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?

aces9: Was a household member depressed or mentally ill or did a household member attempt suicide?

aces10: Did a household member go to prison?

SF-12 Health Survey
(Ware & Gandek, 1998)

hlth1: In general, would you say your health is:

The following questions are about activities you might do in a typical day. Does your health now limit you in these activities? If so, how much?

hlth2: Moderate activities, such as moving a table, pushing a vacuum, bowling, or playing golf

hlth3: Climbing several flights of stairs

During the past month, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

hlth4: Accomplishing less than you would like

hlth5: Did work or other activities less carefully than usual

During the past month, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems?

hlth6: Accomplishing less than you would like

hlth7: Did work or other activities less carefully than usual

hlth8: During the past month, how much did pain interfere with your normal work (including both work outside the home and housework)?

How much of the time in the past month...

hlth9: Have you felt calm and peaceful?

hlth10: Did you have a lot of energy?

hlth11: Have you felt downhearted and depressed?

hlth12: During the past month, how much of the time has your physical health or emotional problems interfered with social activities (like visiting friends, relatives, etc.)?

Perceived Stress Scale
(Cohen et al., 1983)

In the past month, how often have you...

pss1: Been upset because of something that happened unexpectedly?

pss2: Felt that you were unable to control the important things in your life?

pss3: Felt nervous or stressed?

pss4: Felt confident about your ability to handle personal problems? (REVERSE SCORE)

pss5: Felt that things were going your way? (REVERSE SCORE)

pss6: Found that you could not cope with all the things that you had to do?

pss7: Been able to control irritations in your life? (REVERSE SCORE)

pss8: Felt that you were on top of things? (REVERSE SCORE)

pss9: Been angered because of things that happened that were outside of your control?

pss10: Felt difficulties were piling up so high that you could not overcome them?

Quality of Marriage Index
(Norton, 1983)

qmi1: We have a good relationship.

qmi2: Our relationship is strong.

qmi3: My relationship makes me happy.

Manage subscale of CRSI Components
(Adler-Baeder, et al., in press)

First, rate how strongly you disagree or agree with how well each statement describes you during the past month in a typical disagreement:

Manage1_SelfReport: I am able to see my partner's point of view and really understand it, even if I don't agree.

Manage2_SelfReport: When things "get heated" I suggest we take a break to calm down.

Manage3_SelfReport: I can easily forgive my partner.

Manage4_SelfReport: I shout or yell at my partner. (REVERSE SCORE)

Manage 7_SelfReport: I blame, accuse, or criticize my partner. (REVERSE SCORE)