ADVERSE CHILDHOOD EXPERIENCES AND PARENTAL WARMTH: A MIXED METHODS ANALYSIS OF ADVERSITY AND PARENTING BEHAVIOR WITH A COMMUNITY SAMPLE OF MOTHERS

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DISSERTATION ABSTRACT

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Title: Adverse Childhood Experiences and Parental Warmth: A Mixed Methods Analysis of Adversity and Parenting Behavior With a Community Sample of Mothers

Parenting is an important and complex experience that drives a child's healthy development and well-being as an adult. Parenting has strong implications for child outcomes, and the link between a history of adversity and unsupportive parenting practices as an adult has been well-established in research. The effects of childhood adversity on supportive parenting, however, are still unclear. Parental warmth is a key component of supportive practices, but little is known about how exposure to adverse childhood experiences can impact warmth-related parenting behaviors. In order to investigate this relationship further, 84 mothers and their 3 to 5 year-old children participated in parent-child interactions and self-report measures. Data from the Adverse Childhood Experiences (ACE) Questionnaire (ACE-Q; Felitti et al., 1998) and related variables of importance were analyzed using a mixed methods approach with quantitative statistical analyses and qualitative analysis of non-participant observations. This study aimed to closely understand the relationship between ACEs and parental warmth by operationalizing ACEs in three distinct ways, assessing related parenting behaviors, discovering differences among mothers with high ACE scores, and exploring data synergistically guided by qualitative analysis. Findings from this study indicate that more

exposure to adverse childhood events is related to fewer warm behaviors as a parent, and that socio-emotional factors may play an influential role in this association.

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I dedicate this work to radical acts of self-compassion.

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CHAPTER 1: INTRODUCTION

Parenting

Parenting is a salient aspect of our human experience, both in how we were parented as children and how we might parent others. (*Note*: The term 'parenting' will be used here rather than 'caregiving' due to the context of this study; I would also like to recognize the diversity of people, relationships, and communities which can primarily and significantly contribute to raising a child.) Parents and caregivers are typically the most important figures and influences in a child's life. Children rely on their parents to support their physical health and safety, and guide them in attaining emotional, behavioral, social, and cognitive competence (National Academies of Sciences, Engineering, and Medicine, 2016). Parenting can influence a child's overall developmental trajectory, guiding their life course towards healthy flourishing or struggles and instability (Holden, 2010). Parenting impacts emotional abilities in empathy and self-regulation, cognitive skills in executive functioning and effortful control, self-perception, socio-emotional skills and prosocial behavior, emotional flourishing and effective functioning, internalizing behaviors, externalizing behaviors, and positive youth development (Bowers et al., 2014; Chen, Kubzansky, & VanderWeele, 2019; Chen et al., 2019; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Creswell, Murray, Stacey, & Cooper, 2011; Eisenberg et al., 2005; van der Sluis, van Steensel, & Bögels, 2015). Parenting is also regarded as the most important variable in negative life outcomes related to mental health, childhood illness and serious injury, academic performance, school disruption and truancy, substance use disorders, and involvement with the criminal justice system (Hoghughi, 1998). Longitudinal cohort studies have shown the

effects of parenting can be life-long and affect health and well-being as an adult (Smith, 2010).

Parenting is defined here as a complex set of emotions, cognition, and behaviors which are meant to provide care and preparation for a child to develop into a healthy adult. According to Darling & Steinberg's (1993) contextual model, parenting consists of three main components: parenting goals, parenting practices, and parenting style. Parenting goals here are specific to their child's socialization, and include cultural values. Parenting practices refers to the discrete behaviors and overall behavioral patterns a parent conducts in raising their child. Parenting style refers to a parent's general attitude and personal characteristics which shape the "emotional climate" in which a child develops (Darling & Steinberg, 1993, p. 488).

Parenting practices which improve a child's skills, abilities, and life outcomes are typically referred to as positive or supportive parenting. Positive parenting can be defined as "the continual relationship of a parent(s) and a child or children that includes caring, teaching, leading, communicating, and providing for the needs of a child consistently and unconditionally" (Seay, Freysteinson, & McFarlane, 2014, p. 5). Supportive parenting has been shown to improve a child's self-regulation and resiliency under adversity (Waters et al., 2010), achieve social and emotional competencies (Sanders & Turner, 2018), and perform better at school in both academic and social skills (Powell, et al., 2010). Supportive parenting is characterized by higher levels of parental monitoring, autonomy, and warmth (Kwon & Wickrama, 2014). Previous research has identified important aspects of supportive parenting such as child centeredness, positive affect, proactive teaching, positive reinforcement, and inductive disciplinary actions (Pettit,

Bates, & Dodge, 1997). Supportive parenting practices can positively influence a child's development across domains.

Conversely, unsupportive parenting is often conceptualized in academic literature as harsh or negative parenting. As compared to supportive parenting, unsupportive parenting typically includes more negative affect, physical discipline, and psychological aggression such as criticism, negative comments, and threats (Calhoun, Ridenour, & Fishbein, 2019; Tomlinson et al., 2021). Behaviors related to unsupportive parenting include yelling, frequent negative directives, maladaptive emotional expression, coercive acts, and punitive approaches (Chang et al., 2003). These types of practices are associated with higher rates of externalizing behaviors and increased child aggression, early onset of antisocial behavior, conduct disorders, the development of callous-unemotional traits, and increased psychiatric symptoms (Calhoun et al., 2019; Deater-Deckard & Dodge, 1997; Farrington & Hawkins, 1991; Odgers et al., 2007). One of the most dangerous associations of this type of parenting is an increased risk for child maltreatment. Rodriguez, Dumont, Mitchell-Herzfeld, Walden, & Greene (2010) hypothesize that negative parenting develops patterns of negative parent-child interactions which, over time, escalate to abusive or neglectful parenting behaviors. Although the exact mechanisms of parenting which contribute to child maltreatment are unclear, multiple research studies have confirmed correlations between negative parenting and higher rates of child maltreatment (Wolf, Freisthler, & McCarthy, 2021).

Describing parenting as a binary of supportive versus unsupportive practices is an oversimplification of the complex responses and behaviors involved in parenting. Although the lived experience of parenting is usually much more nuanced and dynamic

than this binary of supportive/unsupportive practices, research tends to characterize parenting as either positive or negative (Moran, Turiano, & Gentzler, 2018). Overall, research consistently shows the heavy impact parenting can impart on a child, with unsupportive parenting being related to more negative outcomes and supportive practices promoting competencies, health, skill building, and positive well-being (Moran, Turiano, & Gentzler, 2018).

As well as being highly influential across the lifespan, parenting is a malleable factor. Parenting includes components of knowledge, attitudes, and practices which can be influenced to improve child outcomes (National Academies of Sciences, Engineering, and Medicine, 2016, p. 45). This combination of exerting a high influence on development along with a potential for change and growth makes parenting an important target for intervention. Parenting programs have been shown to be, "among the most efficacious and cost-effective interventions available to promote the mental health and well-being of children, particularly children at risk of child maltreatment and developing social and emotional problems" (Sanders, 2012, p. 347). Understanding more about parenting through scientific study can inform more relevant and efficacious parenting programs, better service provision, and higher-quality protection of children.

Much of the research in this field of study has focused on high-risk populations, such as parents with clinical mental health diagnoses, parents who experienced abuse as children, and adults with complex trauma. However, parenting significantly impacts non-clinical populations as well. The present study aims to address this research gap by examining parenting in a normative, low-risk, community sample.

Parental Warmth

A key aspect of supportive parenting is parental warmth. Parental warmth was one of the first researched parenting styles, initially identified by Sears, Maccoby, & Levin in 1957. Rather than single discrete behavior or practice, parental warmth is a characteristic or style of parenting marked by positive affect (such as laughing, smiling, and physical affection), an overall attitude of support that is sensitive and responsive to child needs, and the direct expression of positive behaviors and emotions (Zhou et al., 2002). Parental warmth also involves affection, admiration, and enjoyment of the child (Davidov et al., 2006). Many experts believe warmth is essential ingredient for positive development and outcomes (Prinzie et al., 2009).

Research findings regarding parental warmth echo those associated with supportive practices as both are linked to a variety of positive child development outcomes across social, cognitive, emotional, and behavioral domains. A meta-analytic review of 30 studies which included 12,087 children from sixteen countries examined the effect of parental warmth on healthy psychological adjustment, finding that perceived parental warmth significantly correlated with a variety of important aspects of children's personality and psychological indicators, including positive self-esteem, emotional responsiveness and stability, independence, positive worldview, and behavioral hostility and aggression (Khaleque, 2013). The relationship between receiving parental warmth and academic achievement has been particularly well studied, with higher levels of warmth being associated with more educational motivation (Fulton & Turner, 2008), better grades and grade point averages (Kim & Rohner, 2002), and less anxiety regarding

academic pressure (Quach et al., 2013). Warmth is also key factor in the development of prosocial behavior (Pastorelli et al., 2021).

The specific ways in which warmth functions to bolster development is not well understood. Chen, Liu, and Li (2000) found sex differences in the impact of warmth for mothers, who contributed more to a child's emotional adjustment. Socio-economic status (SES), an important variable in parenting research, may also influence outcomes (Ogg & Anthony, 2020). Stress associated with parenting under adverse economic circumstances can affect parenting practices, namely exacerbating harsh parenting practices (Ports et al., 2021). Therefore, it may be important to control for SES in investigations of parenting practices not specific to economic circumstances. In addition, studies often rely on assessing perceived warmth or participant responses to items on surveys, which allows for self-report bias (Zhou et al., 2002). There is substantially less research using more objective measures of parenting, such as behavioral observation of parenting behaviors. The proposed data analysis will address this gap by analyzing parent-child interactions to collect data on warmth and other parenting behaviors.

Adverse Childhood Experiences

Just as parental warmth influences childhood development and healthy outcomes, many experiences can influence the ability to provide warm, nurturing parenting. Banyard, Williams, and Siegel (2013) found that traumatic experiences in childhood were related to more negative self-perception as a parent as well as more negative outcomes regarding physical punishment. In a study on parenting behavior within populations who reported mental health issues regarding substance use disorders, depression, and comorbid symptomatology, cumulative trauma significantly predicted negative parenting

with regard to psychological aggression, physical discipline, punitiveness, and abuse potential (Cohen, Hien, & Batchelder, 2008).

These research findings indicate that traumatic events experienced earlier in life may influence the degree of parental warmth which is exhibited as an adult. A specifically identified set of events related to trauma and hardship experienced as a child, known as Adverse Childhood Experiences (ACEs), may also significantly impact parenting (Felitti et al., 1998). ACEs include potentially traumatizing experiences regarding abuse (physical, emotional, sexual), neglect (physical, emotional), and household challenges (mental illness, divorce, parent treated violently, incarcerated relative, and substance abuse) which are experienced before 18 years of age (Centers for Disease Control and Prevention, 2021). ACEs have been shown to have significant, deleterious consequences across almost every domain of health. They are associated with physical health problems in adulthood such as heart disease, cancer, chronic lung disease, liver disease, and skeletal fracture (Flaherty et al., 2009); mental health problems such as increased depression, increased suicidality, and increased symptomatology of mental health disorders (Dube et al., 2001); and behavioral health challenges such as substance use disorders, higher rates of unemployment, decreased educational attainment, and increased externalizing behaviors (Moore, Sacks, Bandy, & Murphy 2014; Lange, Callinan, & Smith 2019).

ACEs related to household dysfunction are associated with an increased risk of child maltreatment (Clemens et al., 2019). Childhood adversity is related to parental distress, a reliable risk factor for child maltreatment and exposure to trauma (Gonzalez & MacMillan, 2008). In a study using self-report measures, Steele et al. (2016) found that

maternal ACE scores were significantly associated with parental stress while controlling for poverty and level of clinical risk as measured in a clinical sample. Similarly, a statistical analysis performed on data from the National Survey of Children's Health showed that parents who reported high parenting stress were three times as likely to experience 4 or more adverse events in childhood (Crouch, Radcliff, Brown, & Hung, 2019). Yamaoka & Bard (2019) found that accumulated ACEs negatively impacted socio-emotional development before the age of six. Significant risk was associated with a lack of positive parenting practices, and the authors suggest that an absence of positive parenting practices may be considered an adverse childhood experience in and of itself. Although this extant literature examines relationships between ACEs and parenting, research tends to focus on negative parenting variables such as parental distress within at-risk populations.

While most work in ACEs uses the ACE-Q (Felitti et al., 1998), versions of ACE questionnaires range in the number of items administered, with most using the original 9 items, some using 10 items, and some using 11 items (Dong, Anda, Dube, Giles, & Felitti, 2003; Murphy et al., 2014; Steele et al., 2016; Yamaoka & Bard, 2019). Similarly, there is no field-wide consensus for the statistical treatment of ACE scores, especially converting them into analytical variables. For example, some researchers have chosen to retain the raw data for use as a continuous variable, often also collecting the frequency of each type of event. Other researchers have instead decided that creating 3 (i.e., 0, 1-5, 6 or more as in Manyema, Morris & Richter, 2018; or 0, 1-3, 4 or more as in Haynes et al., 2020), 4 (i.e., 0, 1, 2-3, 4 and above; Yamaoka & Bard, 2019), or 5 (i.e., 0, 1, 2, 3, 4 and above; Murphy et al., 2014) groups was a more appropriate way to treat the data. It may

also be that a simple presence or absence of childhood adversity could explain variance in observed parenting behaviors, as exposure to even one ACE in childhood is associated with increased risk of lower quality mental health later in life (Hashemi, Fanslow, Gulliver, & McIntosh, 2021). Stempel et al. (2017) write that there is no fieldwide consensus about how to best analyze ACEs, and that differences in how ACEs are screened, summed, and reported can present issues in interpreting scientific findings across studies. This lack of agreement in the literature points to a need for thorough examination of the operationalization and methodological treatment of an ACEs variable.

Considering the multifaceted scope of issues related to parenting and ACEs, mixed methodology may provide substantial benefits to research on these topics. Tashakkori and Creswell (2007) define mixed methodology as research performed in a single study which integrates findings and uses both qualitative and quantitative methods to answer research questions. Mixed methods are particularly valuable when research questions present in a complex social context, and can be used to answer questions that could not be answered any other way (Mertens, 2015). Ho et al. (2021) successfully used mixed methods in a recent study to "generate a fuller understanding of resilience, mental health problems, and ACEs among Chinese young adults" and discovered prominent culture-based characteristics through qualitative analysis. Mixed methodology is expected to add the depth and breadth needed to more accurately describe the relationship between early exposure to adverse events and parental warmth.

This study adds unique value to the scientific examination of ACEs and parenting in multiple ways. ACEs and parenting are both common topics in literature, but a recent systematic literature review only found sixteen studies that examine the direct association

between parenting and ACEs (Rowell, & Neal-Barnett, 2021). These constructs are typically studied using approximations of perceived warmth and self-report measures, and retrospective reporting is a commonly used to collect data on childhood adversity (Goodman et al., 2003). There is limited research using more direct, and potentially more valid and reliable measures, to explore the complexities of parental warmth.

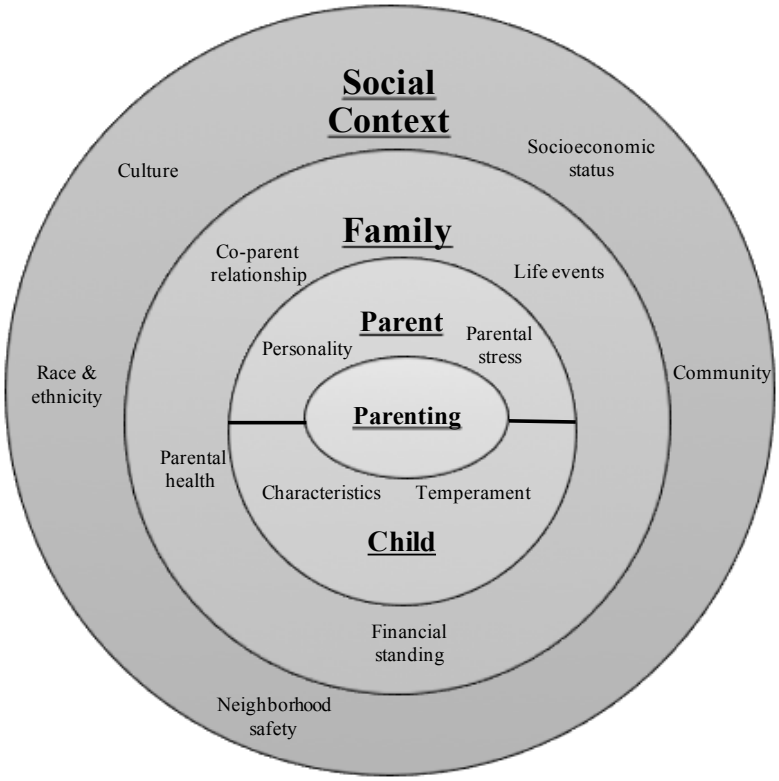
Furthermore, few studies have investigated effects of trauma on the "subsequent generation" parent-child relationship (Hughes et al., 2016). Literature tends to focus on a single participant who reports ACEs and the parenting they received as a child using surveys or questionnaires. Most research in trauma is conducted with participants who are clinically referred, diagnosed, or have existing mental health concerns. This study, however, uses a community sample to understand the relationship between ACEs and parenting in low-risk mothers, which may facilitate generalization to a wider parenting population. Few attempts have been made to understand adversity and parenting with mixed methodology. A core feature of this study is its strength-based approach, which stands in contrast to most research findings which describe negative effects and outcomes.

The complex nature of the phenomenon of parenting calls for an intersectional theoretical orientation, which can not only capture not only the multiple factors that determine parenting, but the interactions between factors and the multidirectional influences of these factors as well. The process model of parenting (Belsky, 1984) describes parental functioning as influenced by multiple determinants in three domains: parental resources, child characteristics, and contextual sources of stress and support. Additional research suggests that greater ecological contexts can also influence parenting

(Kotchick & Forehand, 2002). For example, in a study on youth behavior, adding contextual family variables like neighborhood quality, life distress, and social isolation doubled the variance in delinquent behavior explained by individual family variables alone (Stern & Smith, 1995). Macrosystem factors like socioeconomic status and race/ethnicity have been shown to influence adolescent behavior and parenting (Corcoran, Franklin, & Bennett, 2000) and cultural values, such as prioritizing education, can also influence parental involvement and parenting goals (won Kim, 2018).

To acknowledge the impact of broader, more macro-level variables, Kotchick & Forehand (2002) advanced an ecological model of parenting which emphasizes the social context of parenting as represented in Figure 1, below. Parenting practices are determined by the parent, child, and their interactions as situated within a family context, which is then nested within a greater social context. This theoretical model recognizes the many influences on parenting across multiple ecologies, such as socioeconomic status (SES). SES is a construct which captures the social and economic forces that contribute to hierarchical positionality and unequal distribution of social power, such as education, financial resources, occupational prestige, and knowledge (Bornstein & Bradley, 2014). Lower SES status is often associated with less adaptive functioning, more authoritarian parenting styles, and higher family risk for conflict and physical violence (Roubinov & Boyce, 2017). Broad contextual variables like SES have consistently been shown to influence parenting practices, and should be considered as an important contextual variable.

Figure 1
Representation of the Ecological Model of Parenting



Note. Figure is adapted from (Kotchick & Forehand, 2002).

The current study is designed to address the research gaps described above by further investigating the relationship between maternal adverse childhood experiences and parental warmth through several unique features, namely a general community sample, observational data on parent-child interactions, and integrative findings from both quantitative and qualitative approaches. This study aims to answer the following research questions:

1. What is the association between maternal ACE scores and parental warmth?
2. Which observed parenting behaviors are most strongly associated with a reported history of childhood adversity?

3. What are the differences between mothers with high ACE scores and high displayed warmth, as compared to mothers with high ACE scores and low displayed warmth?

CHAPTER II: METHODS

Participants

As part of a larger, two-session study, 88 self-identified mothers and their 3-5 year old biological children were recruited from a suburban, primarily White and middle class area of the Pacific Northwest, local to the research site. Of these, two videos of parent-child interactions were recorded incorrectly and two participants did not fully complete survey self-report measures due to a technological issue in the delivery of surveys. Data from these participants was considered missing completely at random (MCAR) and removed from the sample using listwise deletion (Little et al., 2014). Thus, the final sample size for this study is 84 mother-child dyads (n = 84). Demographic information regarding the participants can be seen in the table, below.

Table 1
Sociodemographic Information of Participants

		Mothers				Children			
		n	%	*M*	*SD*	*n*	%	*M*	*SD*
Gender (Assigned sex)									
	Female	84	100%	-	-	41	48.81%	-	-
	Male	0	0%	-	-	43	51.19%	-	-
Race									
	White	76	90.48%	-	-	72	85.71%	-	-
	Mixed	6	7.14%	-	-	10	11.90%	-	-
	Hispanic	1	1.19%	-	-	0	0%	-	-
	Native American	0	0%	-	-	1	1.19%	-	-
	Asian	1	1.19%	-	-	1	1.19%	-	-
Ethnicity									
	Non-Hispanic/ Latino	84	100%	-	-	80	95.24%	-	-
	Hispanic/ Latino	0	0%	-	-	4	4.76%	-	-

Table 1, Continued
Sociodemographic Information of Participants

	Mothers				Children			
	n	%	*M*	*SD*	*n*	%	*M*	*SD*
Age in years	-	-	33.02	5.23	-	-	4.04	0.76
Income	-	-	67,501	44,757	-	-	-	-
Years of education	-	-	15.17	2.47	-	-	-	-

Note. Income refers to annual gross family income in US Dollars.

An *a priori* power analysis with G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) was conducted to determine the sample size needed to achieve sufficient statistical power to test the study hypotheses. For regression models with two independent predictor variables, results indicated a minimum sample size of 68 participants was needed to detect a small effect size ($f^2 = 0.15$) at 80% power with an alpha of .05.

Mothers were recruited via virtual and physical fliers posted on social media platforms and public community locations. Snowball recruitment techniques were also layered on as participants could refer others to study participation. Mothers who had previously participated in similar research studies were contacted through email and invited to participate. Inclusion criteria were: mother of a biological child aged three to five who has not been enrolled in formal kindergarten, mother is age 18 or older, mother is with her child at least half-time every week, and mother expects her child to be able to participate in the three-hour parent-child research session. Exclusion criteria were: mother with a history of significant neurological disorder such as seizures or brain tumors, mother presents with magnetic resonance imaging (MRI) contraindications (e.g., braces), the child has or is suspected to have developmental delay or sensory issues,

mother has an open/active case with a state child welfare agency, and mothers who report that English is not their primary language. Researchers informed participants of their rights, and mothers gave consent to participate before beginning the first session. Researchers also performed multiple assent checks with children throughout the session by asking the child whether they wanted to continue participation. Mothers received $60 for participation in each session, typically resulting in a total of $120 reimbursement for participation.

Participants in this study represent a low-risk, non-clinically referred, community sample. Participants do not reflect US national diversity in terms of racial/ethnic or social class backgrounds, but are representative of the town in which the study was conducted. This lower-risk sample allows us to find out more about childhood adversity and parenting behaviors in the local community.

Procedures

The current study is an analysis of secondary data collected from a larger research project, described in detail elsewhere (Giuliani, Harrington, & Trevino, 2021). This larger, two-session project examined how parental behaviors and individual differences shape the development of their child's self-regulation abilities; additional hypotheses regarding maternal brain activity necessitated that mothers complete their tasks while undergoing functional MRI scanning. All data for this dissertation are from the first session of the project, wherein mothers and their children participated in video-recorded parent-child interactions, the mother completed a battery of surveys, and the child participated in a series of assessment tasks.

The video-recorded parent-child interaction consisted of a ten-minute unstructured free play task, a two-minute structured clean up task, and a two-minute structured denied request episode. The interaction began with free play, where mothers were instructed to play with their children as they typically would and were left to play in a room with a bin of age-appropriate toys like blocks, dolls, and toy food. Researchers returned to the room after nine minutes of free play to announce a one-minute warning until clean up time. At ten minutes, a researcher informed the dyad they had two minutes to clean up and put all the toys back in the bin, and the structured clean up task began.

After two-minutes of clean up, the Denied Request episode, adapted from Stansbury and Sigman (2000), began. One researcher stayed with the child and presented them with an array of packaged snacks as a reward for cleaning up. The child selected a snack and were told they could eat it, but only if they received permission from their mother. While the child was choosing a snack inside the room, a second researcher stood outside with the mother and instructed them to withhold permission to eat the snack until both researchers returned to the room. The mother and child were then reunited in the room, with the child instructed to gain permission from their mother, and the mother instructed to withhold permission. This denied request episode lasted for two minutes. To end the task, experimenters then returned to the room and told the child they could eat their snack.

After completion of the unstructured (free play) and structured (clean up, denied request) interactions, mothers were invited to complete a battery of surveys on a laptop while their child participated in a series of assessments with the experimenters. Mothers were asked if they preferred to remain in the room with their child or complete the

surveys in the hallway outside; all mothers chose to remain in the room with their child during the assessments. Some mothers had expressed a preference to complete the surveys at home before the in-person session, and in these cases mothers remained in the room and watched their children complete the assessment.

Measures

Family Demographics

Mothers completed a demographic questionnaire in which they self-reported relevant background information, including their date of birth, ethnicity, gross household income (in US$), and highest level of educational attainment by degree earned. Degree earned was then transformed into years of education, where high school diploma or GED = 12, Associate = 14, Bachelor's = 16, Master's = 18, and Doctoral = 22. They also reported on their child's date of birth, ethnicity, and sex. To measure maternal socio-economic status (SES), self-reported income and years of education were individually *z*-scored and combined into a composite variable representing an SES index.

Adverse Childhood Experiences Questionnaire (ACE-Q)

The ACE-Q was originally designed for Felitti and colleague's (1998) foundational research study using questions from extant published surveys. It is a brief rating scale consisting of nine items which inquire about abuse (physical, emotional, and sexual), neglect (physical and emotional), and household dysfunction (mental illness, incarcerated relative, mother treated violently, substance use, and parental separation/divorce). Mothers indicated whether they experienced events described in each item in the first 18 years of life with a yes/no answer. If the mother indicated yes, the individual item was scored as a one. Items were then summed, resulting in a one through

nine ACE score for each participant. The ACE-Q has widespread use with domestic and international populations and has been validated by multiple studies which have found this questionnaire to be a reliable, predictive measure despite potential self-reporting biases (Zarse et al., 2019). In the current study, a Cronbach's alpha coefficient for the ACE-Q (α = .75), demonstrated sufficient reliability.

Parent-Child Interaction System (PARCHISY)

Parent-child interactions were measured with the Parent-Child Interaction System (PARCHISY; Deater-Deckard, Pylas & Petrill, 1997). The PARCHISY is a numerical rating system which captures multiple constructs of parenting behaviors between caregivers and children. It provides a global rating for each parenting behavior with a single code representing the frequency specific actions relating to that behavior. The PARCHISY was designed to facilitate reliability and intuitive use (Atzaba-Poria, Pike, & Deater-Deckard, 2004). It has been validated through wide-spread use with diverse domestic and international samples (Mullineaux, Deater-Deckard, & Thompson, 2009).

The PARCHISY offers seven codes to rate parental behavior (positive affect, negative affect, positive control, negative control, responsiveness, on-task, and verbalizations), another set of seven codes to rate child behavior, and a third set of three codes to rate dyadic behavior (reciprocity, conflict, and cooperation). Each code is rated on a one to seven scale, where one indicates behaviors were never observed, a four indicates moderate amounts or behaviors displayed through about half of the interaction, and a seven indicates exclusive behavior with no instances of a non-example. The positive affect code captures the frequency of related behaviors such as smiling, laughing, tone of voice, and expressed positive emotion (Deater-Deckard, 2000). The positive

control code is defined as use of rewards, praise, open-ended questions, and explanation (Deater-Deckard, 2000). Positive affect and positive control codes have been combined in previous studies to represent supportive parenting constructs (Mullineaux, Deater-Deckard, & Thompson, 2009). In the current study, positive affect and positive control codes were combined across tasks to represent observed maternal warmth. All three tasks in the parent-child interaction were coded by a team of five graduate students. Codes were applied separately to each task, then combined and averaged together. Although the parent-child interaction tasks vary in their total amount of time, the use of a one global rating for each task helps ensure that all tasks are operationalized in a similar manner. All codes demonstrated acceptable reliability as calculated using Cronbach's alpha: maternal positive control = .90, positive affect = .78, negative control = .92, negative affect = .87, and verbalizations = .86; dyadic reciprocity = .81 and cooperation = .83. Rather than evaluating inter-rater reliability, which indicates how raters consistently distinguish between different items, assessing reliability is recommended as ratings were performed by the same person across multiple occasions (Gisev, Bell, & Chen, 2013). Cronbach's alpha is a well-known and popular estimate of reliability (Bravo & Potvin, 1991), and acceptable values range from 0.70 to 0.95 (Tavakol, & Dennick, 2011).

Exploratory measures

Other measures administered as part of the larger study were used in exploratory analyses for Research Question 3. These measures are widely used self-report surveys which mothers completed regarding their own behavior as a parent, or their child's behavior and emotional milieu. Cronbach's alpha was calculated for each measure using study data; coefficients are provided with descriptions below.

Positive and Negative Affect Schedule (PANAS). The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) is a measurement tool comprised of two separate scales which measure a positive mood and a negative mood as two distinct dimensions. The PANAS is considered a valid and reliable measure with strong psychometric properties, and is frequently used in research as demonstrated by more than 1,600 citations in research articles (Egloff, Schmukle, Burns, Kohlmann, & Hock, 2003). Each positive and negative scale has ten items with one descriptive adjective (e.g. active, distressed, inspired) and participants rate the extent to which they felt these over the last few weeks with a one (very slightly or not at all) to five (extremely) Likert-type rating. Scores range from 10 to 50 for each scale, with higher scores representing higher levels of affect (Watson et al., 1988). In this dataset, Cronbach's alpha was .86 for positive affect and .85 for negative affect.

Coping with Children's Negative Emotions Scale (CCNES). The Coping with Children's Negative Emotions Scale (CCNES; Fabes, Eisenberg, & Bernzweig, 1990) is designed to capture how parents typically respond to the negative emotions of their young children. The tool presents hypothetical situations to adults involving their child feeling angry or upset, and the caregiver is asked to rate how likely they are to respond in one of six ways (Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002). The six types of responses correspond to six subscale categories of typical parental response, like "problem focused reactions" or "minimization reactions." The current study used the Expressive Encouragement subscale, which represents how accepting parents are of their child's negative emotions, and how much they encourage displays of their child's frustration or anger (Fabes et al., 2002). Likelihood of each response is rated on a one

(very unlikely) to seven (very likely) scale. The CCNES has shown to be a valid and reliable tool through test-retest and concurrent validity analyses (Fabes et al., 2002). The CCNES Expressive Encouragement subscale had a Cronbach's alpha of .91 in this sample.

The Center for Epidemiologic Studies Depression Scale (CES-D). The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) measures depressive symptomatology in the general population. Rather than gathering information for clinical diagnosis or treatment, this scale measures the respondent's current level of depression symptoms with a focus on affect and mood (Radloff, 1977). The CES-D is a short, valid, and reliable self-report measure that is one of the three most commonly used scales to measure depression (Van Dam, & Earleywine, 2011). Respondents indicated how often they have felt symptoms within the past week, from "not at all or less than one day" to "nearly every day for 2 weeks," with higher scores indicating more depressive symptoms (Van Dam, & Earleywine, 2011). The CES-D produced a Cronbach's alpha coefficient of .91.

Difficulties in Emotion Regulation Scale (DERS). The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), is designed to evaluate deficits in emotional regulation across four domains of regulation: awareness/understanding, acceptance of emotion, goal-directed behaviors, and access to efficient strategies (Dan-Glauser & Scherer, 2013). Participants rated the frequency of their behaviors that relate to the severity of regulation deficits and strengths on a one (almost never) to five (almost always) scale for 36 items. Examples of items are "I know exactly how I'm feeling" and "When I'm upset, I have difficulty concentrating" (Hallion et al., 2018). The DERS has

shown strong internal consistency, bifactor latent structure, and is widely-used in both treatment and research settings (Hallion et al., 2018). Higher scores indicate more emotional dysregulation or functional impairment. The DERS total sum is used in the current analyses, and showed strong reliability ($\alpha = .94$).

Parent Stress Index – Short Form (PSI-SF). The Parent Stress Index (PSI; Abidin, 1995) is intended to measure the presence of parenting stress and characteristics which are associated with unsupportive parenting. The short form consists of 36 items and parents indicate the extent to which they agree with a given statement on a 5-point scale (Haskett et al., 2006). This produces a total score which ranges from 36 to 180, with higher scores indicating greater levels of stress (Reitman, Currier, & Stickle, 2002). The PSI-SF has high internal consistency and construct validity demonstrated through statistical analysis (Haskett et al., 2006). Cronbach's alpha for the total stress score in the current study was .94.

BASC Behavioral and Emotional Screening System (BESS). The Behavior Assessment System for Children–Third Edition (BASC-3) Behavioral and Emotional Screening System (BESS; Kamphaus, & Reynolds, 2015) identifies a child's risk level for developing behavioral and emotional difficulties. The tool measures externalizing behavior, internalizing behavior, and adaptive skills with nine items for each dimension of behavior (DiStefano, Greer, & Dowdy, 2019). Caregivers rated how frequently they observed a behavior over the past 6 weeks on a 4-point scale, where zero means 'never' and three means 'almost always.' Higher scores represent greater amounts of maladaptive behavior. This study uses the BESS general risk score, which showed marginally acceptable reliability in this sample ($\alpha = .65$). The index risk score has been shown to

effectively detect emotional and behavioral risk in children and youth in other research projects (Basting, Naser, & Goncy, 2020).

Quantitative Analysis Plan

Quantitative analyses began with preliminary evaluation of descriptive statistics and histograms to examine the data. MCAR data was removed using listwise deletion. R open source software (version 4.1.2) was used for statistical analyses, as well as the packages *tidyverse*, *reghelper*, and *interactions.* Potential covariates were identified from the literature; those found to covary meaningfully with the dependent variables were retained. Research question 1 was tested via three separate linear regressions, each of which treated the ACEs variable differently. Assumptions of regression for the final model, in which raw ACEs data were used, were also tested and results are interpreted accordingly. To assess the relationship between ACE scores and multiple types of parenting behaviors for Research Question 2, a correlation matrix using Spearman's correlations was created. Spearman's correlations were chosen because they are non-parametric measures of association, which was a better fit for the distributions of the variables. Observationally coded variables that showed significant or close-to-significant associations with ACEs were then subjected to linear regression controlling for maternal SES. Exploratory statistical analysis was also conducted, guided by qualitative findings. ANOVA, regressions, and a moderation analysis were used to investigate relationships between ACEs, warmth, and other extant variables in the dataset.

Qualitative Analysis Plan

Video recordings of parent-child interactions were qualitatively analyzed as non-participant observations. Observation "provides a direct and powerful way of learning

about other people's behavior" (Maxwell, 2005, p. 94). In overt, non-participant observation, a researcher observes situations in a passive role, without interacting with those being observed (Quaye et al., 2019). Participants are aware that they are being observed, and interactions are situated within a contextually relevant setting. Non-participant observation is a data collection system that is used extensively in case study and ethnographic research to gain a richer and more direct understanding of a phenomenon within its own context (Liu et al., 2010).

Non-participant observation has been effectively applied to interdisciplinary fields, and has been used in healthcare settings to gain a better understanding of complex processes such as hospitalization decision-making (Hallström & Elander, 2004; Runeson et al., 2002). Eldh et al. (2020) analyzed interviews and survey questionnaires along with data collected over two years in an international nursing research study to determine whether observations provided additional insight and value to their project. They found that observations uncovered two important contextual elements which impacted evidence-based practice and implementation processes that were not otherwise evident. Eldh et al. (2020) noted that, although observation is under-used, it can provide valuable insights, a more complete understanding of data, and unique contributions to findings.

Best practices in qualitative analysis of observations typically follow processes outlined in Spradley's (1980) work, *Participant Observation* (Liu et al., 2010). Spradley (1980) defines qualitative analysis as a search for patterns (p. 85). He describes a research sequence of specific tasks for analyzing observational data which becomes more targeted as it progresses. Observations are first described in field notes then considered through more focused domain and componential analysis. Domain analysis identifies categories

of meaning which emerge from observation data. Spradley provides worksheets, paradigm charts, and a descriptive question matrix (p. 82) as tools to guide qualitative analysis of observations and select meaningful categories for further inquiry. A componential analysis, described as the process of searching for, sorting, and grouping contrasts (p. 133) is then conducted to refine findings. A concluding task is creating a summary overview, which condenses information and allows for the discovery of thematic differences. This process aligns with the three "cornerstone" tasks needed to produce high-quality qualitative analyses: gathering, focusing, and analyzing data (Lofland et al., 2006).

This qualitative analysis is distinct from the quantitative method of coding, where a pre-established coding scheme like the PARCHISY is applied to understand the frequency of identified behaviors. In using non-participant observation, the goal is not to quantify, "but to 'fracture' the data and rearrange them into categories that facilitate comparison" (Maxwell, 2005, p. 96). This methodology locates an observer in the world and provides a means of interpretation to make this world visible (Mertens, 2015). Purposeful selection of observations and a structured approach to data analysis were chosen to encourage comparability across participants (Maxwell, 2005, p.80). An analysis plan was developed in accordance with Spradley (1980), and reviewed before any observations were viewed. Non-participant observation analyses can add synergistic value to research findings, address the context and complexities of a phenomenon, and provide a more complete understanding of data and theory (Mertens, 2015). This analysis is also intended to honor participants by humanizing their data and utilizing the entirety of the data they contributed to the study.

Conclusions from the qualitative analysis portion of this study were then used to motivate exploratory quantitative analyses, limited to the available measures collected as part of the original study. Measures that seemed like they may capture group differences identified in the qualitative analysis were investigated in two ways. First, average scores on those measures for the high-ACE/high-warmth and high-ACE/low-warmth mothers were calculated and compared. Second, interactions between ACEs and each individual measure were entered into separate regression models accounting for variance in warmth.

CHAPTER III: RESULTS

Preliminary analyses

Initial statistical tests were run to determine the potential influence of covarying factors on the hypothesized associations between ACEs and parenting behaviors. Previously identified candidates for covariates based on extant literature were: gender (assigned sex of the child), age of the child, and SES (Lippold et al., 2016; Suchman et al., 2007; Chen et al., 2019; Carroll et al., 2013). To test whether the means of rated maternal warmth differed by gender (assigned sex at birth of the child), an ANOVA was conducted. Results were not significant, indicating that child assigned sex was not associated with observed warmth in this sample, $F(1,82) = 0.002$, $p > .05$. The means of warmth by gender can be seen in Table 2, below.

Table 2
Means of Warmth by Child Gender

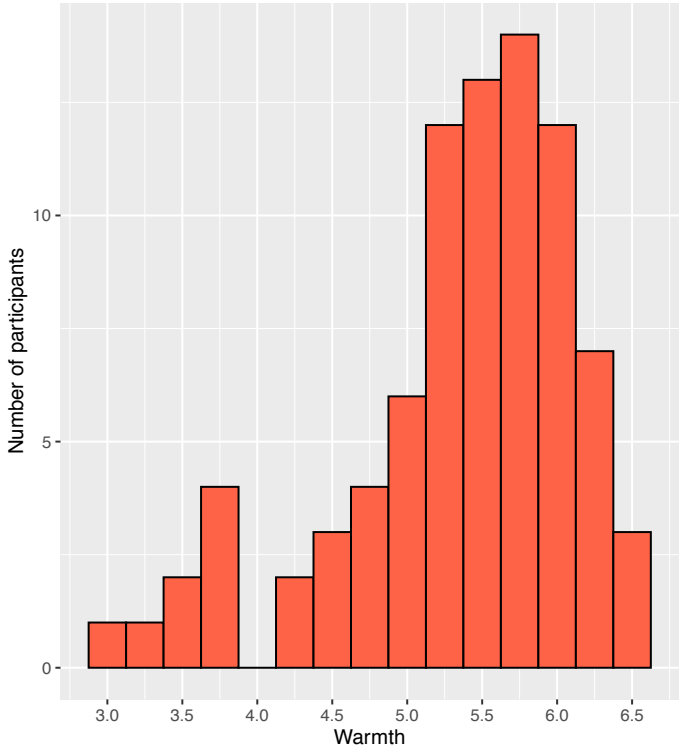
Child Gender	Mean of Warmth
Male	5.355
Female	5.348

To assess the impact of the other two potential covariates, a correlation matrix using Spearman's coefficients was developed. There was no significant relationship between warmth and child age, $r(82) = -0.03$, $p > .05$. There was a positive association between warmth and SES, $r(82) = 0.21$, $p = .052$. Due to the association being very close to significance, and previous research findings regarding a relationship between SES and parenting outcomes (Steele et al., 2016), SES was included as a covariate in this sample. All following analyses therefore controlled for mothers' socioeconomic status.

Research Question 1: What is the association between maternal ACE scores and parental warmth?

A histogram of the dependent variable, warmth, is shown below.

Figure 2
Histogram of Warmth Variable



Note: Warmth is measured on a 1 to 7 scale.

Scores representing the construct of warmth ranges from 3.0 to 6.5 (out of a possible 1 to 7 range), with skewness of -1.083 and kurtosis of 3.766. While the warmth variable is negatively skewed, we chose to retain the raw data due to the mild amount of skewness.

Maternal ACE scores were operationalized in three distinct ways. First, total ACE score was transformed into a binary variable indicating the absence or presence of ACEs (0 vs. 1-9). A linear regression was conducted with the dichotomous ACE variable as the

IV, observed maternal warmth as the DV, and SES as the covariate. Results were not significant, $F(2,81) = 2.23$, $p > .05$.

Table 3
Means of Warmth by Absence or Presence of ACEs

ACE Presence	Mean of Warmth
Absent ($n = 21$)	5.58
Present ($n = 63$)	5.27

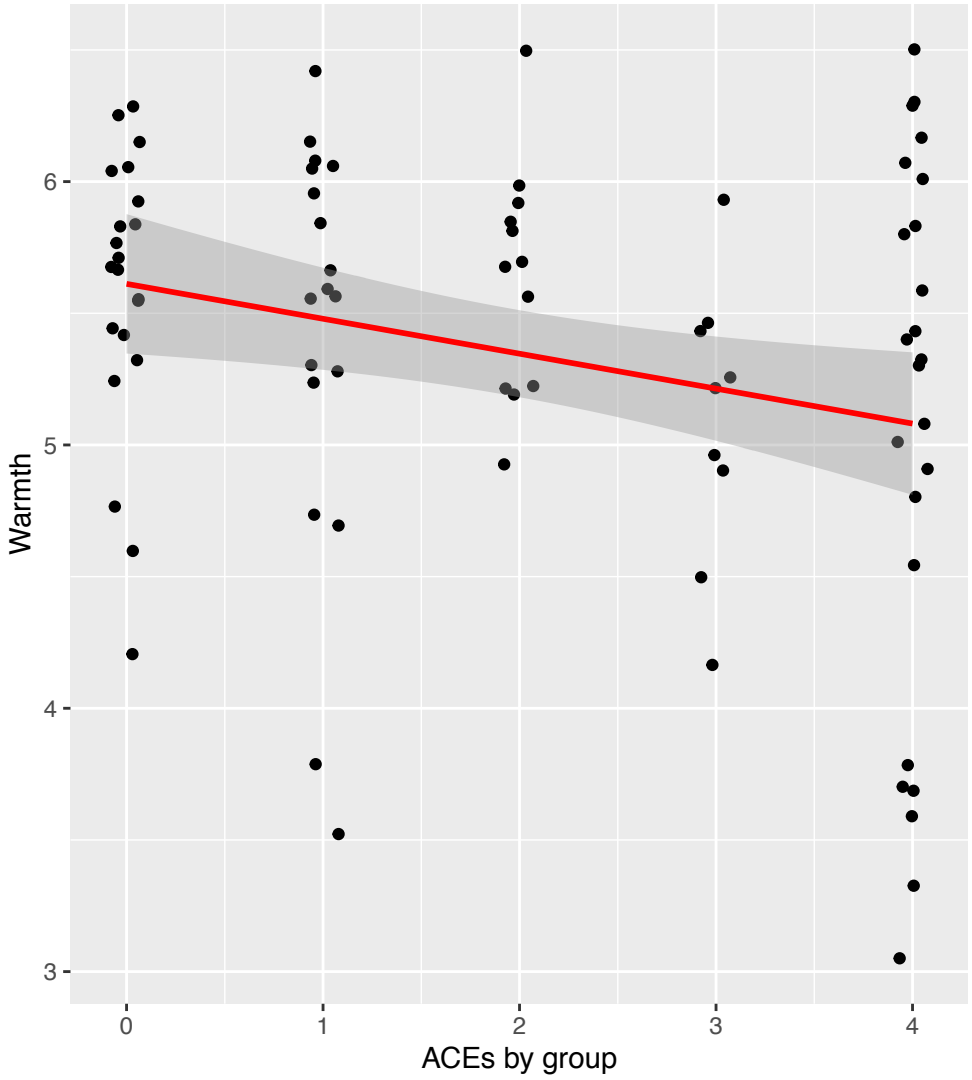
Second, levels of ACEs were grouped according to clinical outcome (0, 1, 2, 3, 4 or more). There were 9 to 24 participants in each group, with the number of participants in each clinical grouping presented in Table 4, below.

Table 4
Sample Sizes of ACEs Clinical Groups

Group number of ACES	0	1	2	3	4 or more
$n =$	21	18	12	9	24

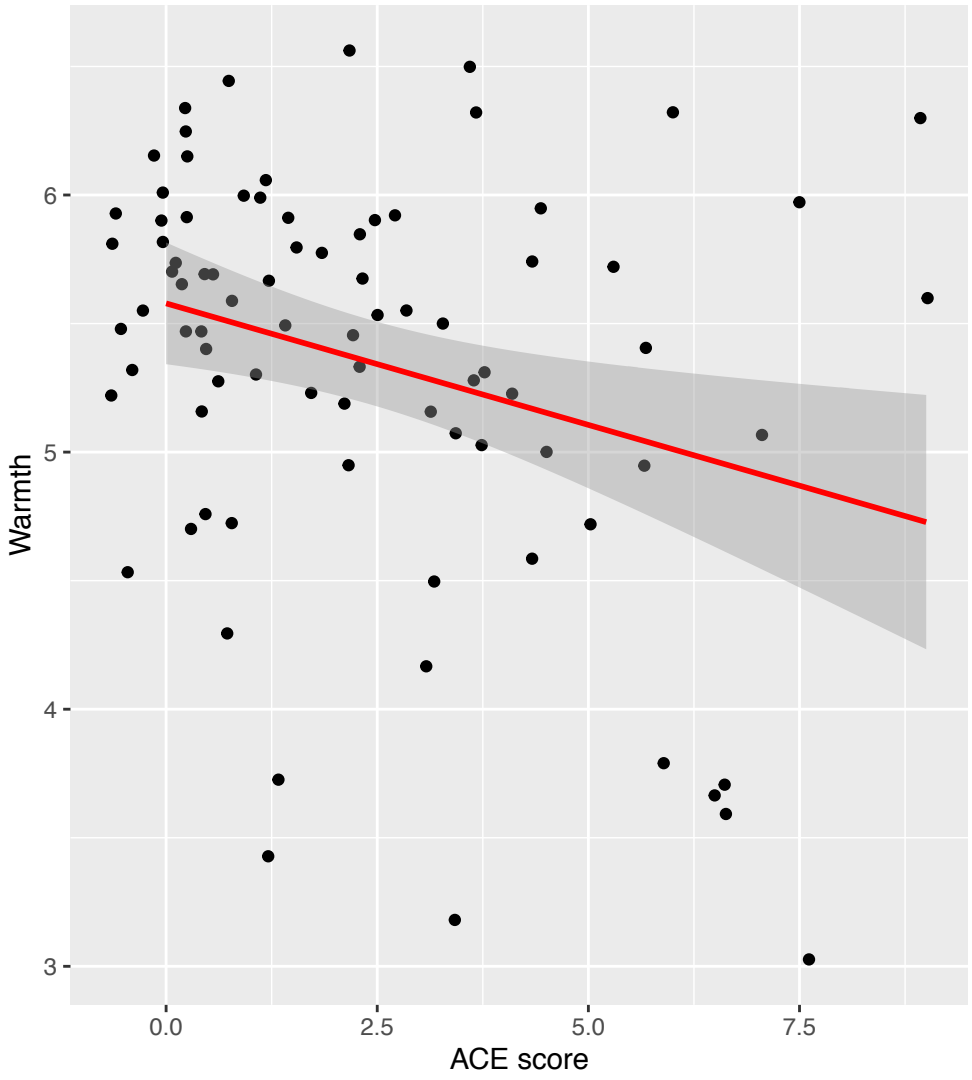
Another linear regression predicting warmth was conducted controlling for SES, with ACEs represented as clinical groups. A significant negative relationship was found, $F(2, 81) = 3.55$, $p < .05$, such that lower levels of observed warmth were found in mothers who reported higher numbers of ACEs. This is represented graphically in Figure 3, below.

Figure 3
Association of Warmth and ACEs Grouped by Clinical Level



Lastly, a linear regression predicting maternal warmth was run on raw ACE scores, controlling for SES (shown in Figure 3). Results were significant, such that higher ACE scores were associated with significantly less observed parental warmth, $F(2,81) = 3.81$, $p < .05$. This model was chosen as the best model for the data, as it involved the least amount of data transformation and produced the highest F-statistic.

Figure 4
Association of Warmth and ACEs as Raw Scores

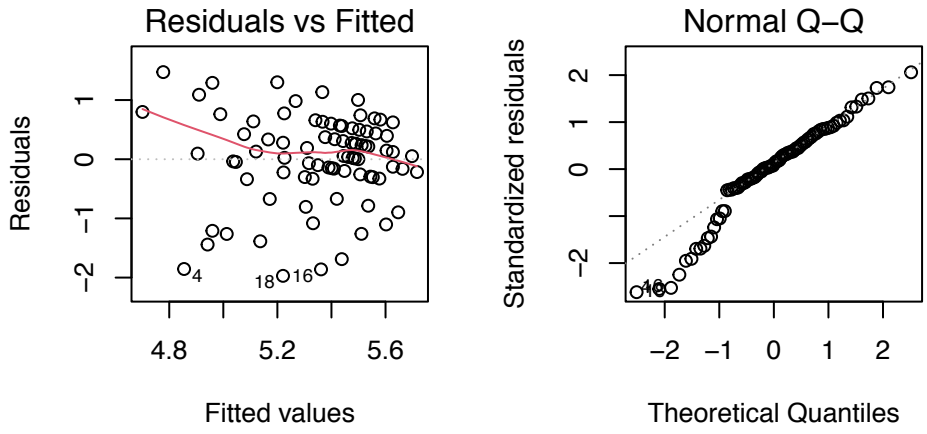


Assumptions of regression indicated that this result should be interpreted cautiously, as the model includes high leverage points as indicated by Cook's distance. Leverage points were identified through testing assumptions for regression, but were kept in the model as they are considered accurately representative of mothers in the study.

Further assumptions for the best-fitting regression model were assessed via diagnostic plots. The regression model in which ACEs are operationalized as a raw score

was selected as the best-fitting as it explains more variance and results in a higher F-statistic. A plot of residual versus fitted values (shown in Figure 4, below) indicated an approximately linear distribution of residuals. In a normal Q-Q plot, the majority of data points follow the linear trajectory. Although a potentially heavily tailed data pattern emerged, this assumption was met as this pattern was only seen in a minority of data points (Stine, 2017).

Figure 5
Diagnostic Plots for ACE Score Regression Model



Research Question 2: Which observed parenting behaviors are most strongly associated with a reported history of childhood adversity?

To assess the relationship between ACE scores and multiple types of parenting behaviors, a correlation matrix using Spearman's correlations was created. As stated earlier, different types of observed parenting behaviors were coded with the PARCHISY tool. PARCHISY codes for observed behaviors regarding maternal negative control, maternal negative affect, maternal verbalizations, dyadic reciprocity, and dyadic

cooperation were included in this analysis. Correlation coefficients with p-values corrected for multiple comparisons using the Benjamini-Hochberg method (Benjamini & Hochberg, 1995) is shown below.

Table 5
Correlations of ACEs with Observed Parenting Behaviors

	ACEs	Neg Control	Neg Affect	Verbalizations	Reciprocity	Cooperation
ACEs	1	.221	.242[a]	-.117	-.091	-.103
Neg Control		1	.578***	-.037	-.312	.221
Neg Affect			1	-.071	-.298	-.522***
Verbalizations				1	.492***	.217
Reciprocity					1	.624***
Cooperation						1

Note: Values shown are Spearman's rank correlations. *p < .05*, p < .01**, p <.001****

[a] *p = .058*

As the zero-order correlation between ACEs and negative affect was close to significant ($p = .058$), it warranted further investigation. However after controlling for SES, a linear regression showed no significant relationship between ACE scores and observed negative affect, $F(2,81) = 1.95$, $p > .05$.

Research Question 3: What are the similarities and differences between mothers with high ACE scores and high displayed warmth, as compared to mothers with high ACE scores and low displayed warmth?

The qualitative analysis of mothers with high ACE scores followed a process of viewing recordings and organizing thoughts and findings in multiple formats as per Spradley's (1980) methodology for observation analysis. As transparency and reasoning

in qualitative analysis increases scientific rigor, all the steps of the qualitative analytic process are listed below (Harley & Cornelissen, 2022).

First, videos were selected of mothers who were above (high-warmth) or below (low-warmth) 1 standard deviation from the mean of rated warmth via the PARCHISY. All of these mothers were in the high-ACE (4 or higher) group, resulting in 3 high-ACE/low-warmth mothers, and 4 high-ACE/high-warmth mothers. Socioeconomic characteristics of each group are presented below.

Table 6
Means of SES Characteristics by Warmth Group

Warmth group	Income	Education	SES index
Low	55,600	15.33	-0.10
High	34,250	14.5	-0.51

Note. Income refers to annual gross family income. SES index is presented in z-scores.

The analyst (SRF) began by watching each recording, blinded as to whether mothers were in the lower warmth or higher warmth group. They transcribed sections of the videos, noted salient interactions, and reflected on the content of the videos. This process of reviewing the data and taking field notes is always considered a best-practice first step in qualitative analysis (Maxwell, 2005). They then rewatched all the videos, taking more notes, transcribing more interactions, and formulated more thoughts and opinions about the videos' content. After viewing the videos twice, they analyzed their notes and memos and conducted a domain analysis (Spradley, 1980). They selected domains of analysis related to emotional regulation, child compliance, child temperament, physicality, bond, and other categories related to thematic differences. To conduct componential analysis, profiles for each participant dyad were created (Spradley,

1980). Profiles listed selected domains, a description of each task and outcomes (e.g., Did the dyad finish cleaning up? What kinds of games were played?), analyst impressions about each task, transcribed sections that were typical of the dyad's overall behavior, transcribed sections of particularly salient interactions, and additional notes about mothers' behaviors.

The analyst then unblinded themselves as to the high/low warmth group membership for each mother. They reviewed all participant profiles and researcher reflections, rewatched videos as needed, and developed initial themes regarding differences between groups. They wrote a summary overview (Spradley, 1980) of important aspects of recordings for low warmth mothers as a set, and then a summary for high warmth mothers. The summaries indicated initial themes regarding differences, which were then followed up with another round of data review. All videos for mothers in the lower warmth group were rewatched together as a set. Videos of higher warmth mothers were also rewatched as a set. Additional notes were taken on each participant's individual profile, as well as insights regarding themes regarding group differences.

Throughout the analytic process, the analyst (SRF) attended to the iterative and interactive nature of the mother-child dyad. In the ecological model of parenting, both the parent and the child are represented as the central unit of focus, rather than a single person (Kotchick & Forehand, 2002). Research has also shown that characteristics of a child can directly affect parenting practices, and the complex, bidirectional interactions between parents and their children can shape overall parenting practices and outcomes (Karraker & Coleman, 2006). The interplay between the mothers and their children was considered throughout all stages of analysis, and specifically emerged from the data

during the domain analysis. The analyst identified domains of importance related solely to the child (eg. child temperament), as well as domains which captured how the mother and her child might be influencing each other throughout the parent-child interaction. For example, the identified domain of child compliance was considered in relationship to the domain of parent issued directives as these domains are typically reliant on each other. A direction must be issued for a child to display compliance, and a child's compliance can relate to the likelihood or frequency of subsequent directions.

Condensing information through a process of domain and componential analysis and allows for the discovery of thematic differences (Spradley, 1980). Qualitative analysis with non-participant observations of parent-child interactions thus resulted in the following observations regarding thematic comparisons between high and low warmth mothers.

The main similarity between groups were the noted displays of supportive parenting in both warmth groups. Every mother in this qualitative analysis praised their child throughout the observations. Regardless of high or low warmth, mothers tended to show physical affection towards their children, provided encouragement, and modeled desirable behavior. All mothers also echoed and restated their children's language. These similarities show that overall, mothers in both high and low warmth categories displayed praise and supportive behavior that indicated caring and love for their child.

Bond

Interactions reflected different degrees of friendship and closeness. Mothers that were rated as higher on warmth seemed to enjoy their child and relationship with them compared to mothers who were rated as lower warmth. Higher warmth mothers and

children were often in close physical proximity to each other throughout tasks, like sitting right next to each other on a couch, or playing with their bodies oriented toward each other. These dyads often smiled at each other, had direct eye contact when communicating, and frequently looked at each other. They seemed to share attention and positive feelings together. When a child expressed worry about the sound of a toilet when accompanying mom to the bathroom, she said, "Don't worry, it won't be loud. I'll protect you." Mothers in the higher warmth group often promoted positive, healthy feelings between them and their child.

Mothers in the lower warmth group did not appear to promote these types of positivity and closeness in their interactions. This seemed more in line with a lack of positive bond or friendship than an explicitly negative relationship. All children in the lower warmth group also asked their mothers to stop some displays of physical affection with verbal statements or body language. Transcribed sections of the recorded observations are presented below to further illustrate themes.

Low warmth examples:	High warmth example:
Child tries to get something out of toy bag. Mother: "Do you want to me to help?" Child doesn't reply and keeps playing with toy bag. Mother: "Oh that one's stuck. Do you need help?" Child doesn't reply.	Researcher: "It's time to clean up." Mother: Gasps and smiles at child. "Okay!" Mother holds open bag while child puts in toys. "Alright. Here we go bubbie." Mother and child both put toys into bag. Child: "The (toy) strawberries stick to there." Mother: "That's so cool! That's neat. Isn't that neat?"
Mother and child read a book with the child sitting on her lap. The child slides off her lap and wiggles away from her. Mother: "Hey you want to sit and read the story?" C: "Noooo."	Child: "Yeah!" Mother: "I like it. Okay." Mother and child put toys away together. Child: "Mommy, get the blocks." Mother: "Okay. You finish the blocks and I'll put the drawer away."

M: “You don’t? You don’t want to finish reading the story?” C: “I want to smash!” (picks up block)	Mother: “Got ‘em?” Child: “Yep.” Mother: “Awesome! Good job!” Mother and child high five.

Confusing interactions

All three dyads in the lower warmth set showed at least one interaction that seemed confusing, unclear, or communicated mixed messages to the child. Comparatively, parent-child interactions in the higher warmth set did not show these types of situations, and conversations tended to clarify actions or thoughts. Examples of confusing interactions from observation of the lower warmth mothers are shown below.

Low warmth confusing interaction, example 1:

Child tries to grab doll baby from mother.
Mother pushes child’s hand away saying “Okay, gentle, wait, wait, wait.”
Mother: “Here.” Tries to hand doll to child.
Child turns away from mother and walks on his knees to the corner of the room to get different toys.
Mother: “Look, the baby is going to sleep.”
Child does not respond.

Low warmth confusing interaction, example 2:

Mother sees her child is holding a toy.
Mother reaches for toy and tugs it in the child’s hand.
Child holds on to toy and smiles.
Mom lets go and the child hides the toy behind her back.

Low warmth confusing interaction, example 3:
Mother holds a piece of candy in her hand. "We're going to wait." Mother places candy on the coffee table in front of them. Child grabs candy from the table. Mother grabs the child's arm with the candy and lifts him onto the couch with her. Mother: "Put it back." Child: "No, no, no, no, no!" Mother smiles at child and kisses his cheeks.

Academic vs. SEL content

All three mothers who displayed lower warmth discussed academic content with their child during observations. These mothers asked questions about numbers and letters, colors, animals, and shapes. These questions were often prompted by toys and puzzles as well as objects in the room (e.g., a clock, a hanging painting).

Some mothers who displayed higher warmth also included academic content in their activities, but all higher warmth mothers also included content related to socio-emotional learning (SEL) as well. These mothers asked questions about emotion, attended to feelings of both themselves and the child, and connected states of being to social contexts. For example, a child pretended a toy chicken was sick and the mother responded, "I hope you get well soon!" In another observation, a child pretended a toy car was sleepy and the mother responded, "I'll see you later when you wake up." These mothers also tended to model politeness and manners, often using "please" and "thank you" during interactions.

Low warmth example:	High warmth example:
Child holds toy phone and says "Hello" to his mother. Mother: "Hello. (Holds up block) What number is this?"	Mother and child pretending to talk on toy phone. Mother: "Oh Alec didn't come?" Child: "No." Mother: "How did that make you feel?"

	Child: “Good.” Mother: “Good? You’re happy to be by yourself?” Child: “Yeah.” Mother: (Laughs)

Control vs. Flexibility

While mothers in the lower warmth group tended to display behaviors related to controlling the activity or the child’s behavior, mothers in the higher warmth group tended to display flexibility and acceptance. Mothers who showed lower warmth behaviors issued many directives, and often repeated the same directive multiple times. Two out of the three mothers used hand-over-hand prompts to physically guide their children to pick up toys and put them in a bin during clean up. These control-related behaviors seemed to reinforce a power differential between the adult and the child, where the mother displayed more direction and authority.

In comparison, mothers in the higher warmth group seemed to “roll with it” in their interactions. These mothers issued few directives, and often stated them as questions, suggestions, or light prompts. Rather than directly telling her child to pick up toys during clean up, one mom pointed at a toy and asked, “Did you get this one out?” Another child seemed puzzled about a toy’s location and the mother asked, “Well… why don’t you find them?” Higher warmth mothers often used redirection as a strategy, while no mothers in the lower warmth group tried to redirect their child’s behavior.

<u>Low warmth example:</u>	<u>High warmth example:</u>
Mother opens a bottle of water for her child. Mother: “Not too much!”	Mother places toy in toy boat. Child: “No.” Mother: “You don’t like that?”

Child continuously gulps water. Mother grabs bottle from him. Mother: “That’s enough.”	Mother puts down toy and picks up another one. Child: “No, no! Gimme!” Mother hands toy to child.

Personality and Mood

Mothers in the higher warmth group often showed more self-confidence and playfulness in their interactions. They showed exaggerated expressions during play, saying things like “Whoa!” and “Cool!” They also audibly gasped to act impressed or surprised, or feigned heightened emotion during play with emphasized facial expressions. The positive affect of these mothers seemed to generalize to social interactions in general, and higher warmth mothers smiled more at researchers and used a positive tone of voice in their discussions about the study procedures. This may indicate that more positive affect in parenting behaviors is related to stable personality traits and broader social interactions beyond parenting. This thematic difference motivated further statistical analysis with exploratory measures, described in the following section.

In contrast, mothers who displayed lower warmth behaviors seemed quieter or more muted. One mother talked at such a low volume, the recording could not pick up much of her audio. This suggested a potential relationship with depression, as depression is well known to affect speech and vocal pitch, rate, and loudness (Mundt et al., 2007). Mothers in this group showed behaviors and personalities which appeared more neutral than happy or smiley. One mother was visibly frustrated with her child’s behavior and after her child asking about his play preferences, shook her head to herself and said, “Of course you don’t. You just want to play with everything, don’t you?” Whether these reactions were related to stable traits, mood, or mental health was unclear.

Low warmth example:	High warmth example:
A toy pops out of a bag, and looks like it jumped up high of its own accord. Child: (Laughs emphatically.) Mother: (Chuckles.) "That's so silly."	Child looks through bin to find toy food. Mother: "Oh my gosh! You're so good! You're finding them SO fast!" Child shows mother two toys she has selected. Mother: "Oh I LOVE it! They're soft too."

Importantly, although thematic differences were found, all mothers showed some supportive parenting behaviors, warmth, and strengths. This could be reflective of the low-risk nature of this community sample. Group differences did not indicate that mothers in the lower group showed no warmth at all, and every mother showed care and attended to their child's needs.

Exploratory analysis

Through qualitative analyses, I identified several domains in which high-ACE/high-warmth mothers seemed to differ from high-ACE/low-warmth mothers. In particular, the high-warmth mothers appeared more bonded, flexible, and playful than the low-warmth mothers, and used more clear, social-emotional language when talking with their children. While my exploratory analyses were limited to the measures collected in this sample, I was able to select a set of self-report measures completed by these mothers to test whether there were differences between the two groups of mothers in reported parenting stress, depressive symptoms, emotion regulation difficulties, affect, coping, and child behaviors.

Small group ANOVAs

As a first step, ANOVAs were conducted with candidate measures to determine whether there was a significant difference in means for high vs. low warmth in the high ACE subset while controlling for SES. No significant relationships were found; results are reported in Table 7, below.

Table 7
Group means and ANOVA results for ACEs with Observed Parenting Behaviors

Measure	Low-warmth Group Mean	High-warmth Group Mean	*F*	*p*
PANAS Positive Affect	41	33	4.047	.115
PANAS Negative Affect	19	17.8	0.116	.75
CCNES Expressive Encouragement	6.35	5.52	3.067	.155
CESD Depression Scale	15	11	0.221	.663
DERS Emotion Regulation Scale	61	74.5	0.347	.588
Parent Stress Index	79.3	98.8	0.784	.426
BESS Child Risk Index	22.7	28.5	0.361	.58

Note: PANAS = Positive and Negative Affect Schedule; CCNES = Coping with Child's Negative Emotions; CSED = Center for Epidemiologic Depression Scale; DERS = Difficulties with Emotion Regulation Scale; BESS = BASC Behavioral and Emotional Screening System Questionnaire, Emotional and Behavioral Risk Index. All analyses controlled for socioeconomic status.

Full-sample regressions

Full-sample regressions using variables identified from the small group ANOVAs were then conducted to statistically test the degree to which ACEs were associated with

these variables across the whole sample while controlling for SES. No significant associations with ACEs were discovered for measures related to affect (Positive and Negative Affect Schedule), child behavior and adaptive skills (BASC Behavioral and Emotional Screening System Questionnaire, adaptive skills subscale), and coping (Coping With Child's Negative Emotions). Regression did reveal a significant relationship between ACEs and parenting stress (Parent Stress Index), $F(2,81) = 8.904$, $p < .001$, such that higher ACE scores were associated with higher levels of parenting stress. This finding is consistent with previous research findings regarding the effect of childhood adversity on parenting via increased stress (Crouch et al., 2019). Further significant results of full-sample regression testing are presented in Table 8, below. Values correspond to results for the independent variable of ACEs.

Table 8
Regression Results for Exploratory Measures

Measure	*R*-squared	*F*-value	*P*-value
The Center for Epidemiologic Studies Depression Scale (CES-D Scale)	0.142	7.89	< .01
Difficulties with Emotion Regulation Scale (DERS)	0.054	3.37	< .05
BASC Screening System (BESS) for externalizing behavior	0.141	7.73	< .001
BASC Screening System (BESS) for internalizing behavior	0.072	5.54	< .001
BASC Screening System (BESS) total behavioral and emotional index	0.0997	4.16	< .01

Moderation Analysis

To further explore the data, I ran a set of simple moderator analyses to see how these variables might interact with ACEs in accounting for variance in warmth. These

were performed using linear regression on the entire sample (n = 84), controlling for SES. The outcome variable for all analyses was observationally coded warmth. The predictor variable was a participant's ACE score, and the moderator variables were scores on the candidate measures described above. All variables were zero-centered. Interactions and main effects between all identified measures and ACE scores were assessed in seven different models. Each model included the main effects of ACEs and the candidate self-report measure, the interaction term of the two, and the SES composite. All results are reported in the table below.

Table 9
Moderation Analysis Results for Exploratory Measures

Model	Variable	*b*	SE	*t*	95% CI		*p*	Fit
					LL	UL		
1	Intercept	5.356	0.090	59.350	5.170	5.540	< .001	
	SES index	0.083	0.105	0.790	-0.130	0.290	0.432	
	ACEs	-0.088	0.043	-2.030	-0.170	-0.001	0.046	
	CESD	0.004	0.011	0.330	-0.018	0.025	0.745	
	ACEs x CESD	-0.001	0.004	-0.120	-0.009	0.008	0.904	R^2 = 0.087
2	Intercept	5.350	0.085	62.860	5.181	5.520	< .001	
	SES index	0.073	0.105	0.700	-0.136	0.283	0.489	
	ACEs	-0.089	0.040	-2.250	-0.169	-0.010	0.028	
	PANAS NA	0.010	0.015	0.680	-0.020	0.040	0.500	
	ACEs x NA	0.001	0.007	0.120	-0.012	0.014	0.905	R^2 = 0.092
3	Intercept	5.350	0.083	64.130	5.184	5.516	< .001	
	SES index	0.075	0.106	0.700	-0.136	0.285	0.483	
	ACEs	-0.084	0.039	-2.170	-0.161	-0.007	0.033	
	PANAS PA	-0.011	0.014	-0.800	-0.038	0.016	0.425	
	ACEs x PA	-0.003	0.005	-0.530	-0.014	0.008	0.599	R^2 = 0.1

Table 9, continued
Moderation Analysis Results for Exploratory Measures

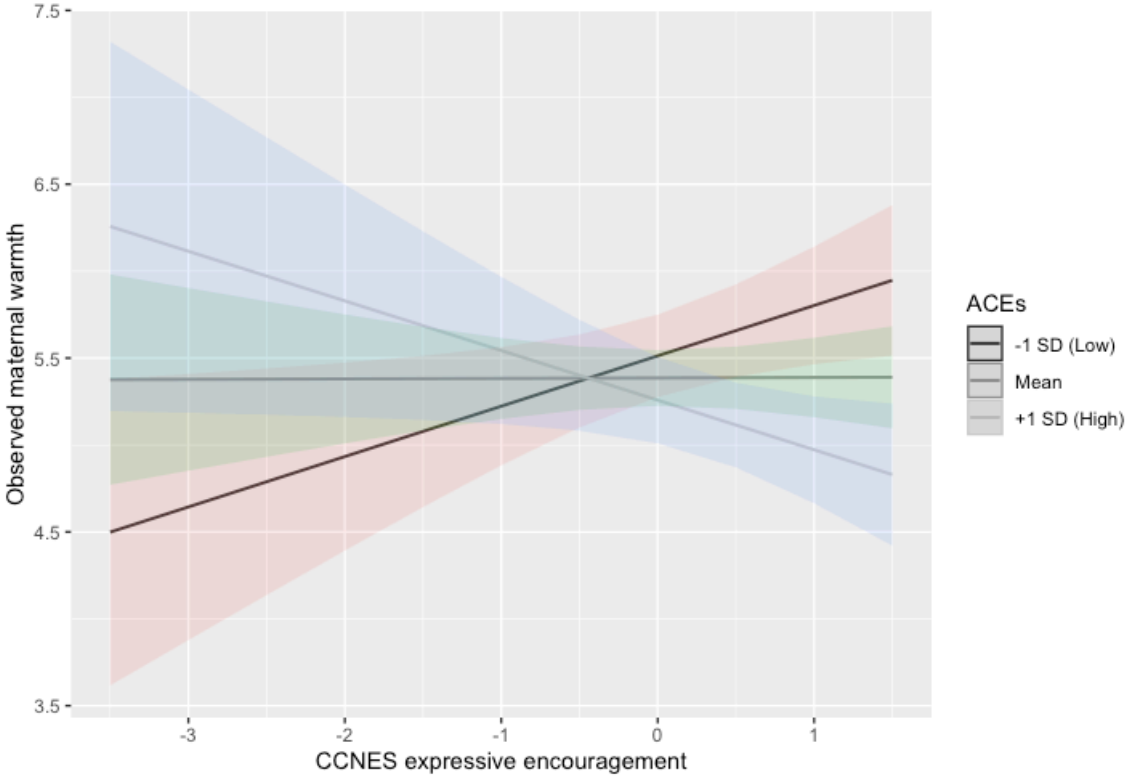
Model	Variable	*b*	SE	*t*	95% CI		*p*	Fit
					LL	UL		
4	Intercept	5.336	0.086	61.790	5.164	5.507	< .001	
	SES index	0.078	0.104	0.750	-0.130	0.286	0.457	
	ACEs	-0.095	0.041	-2.330	-0.175	-0.014	0.022	
	DERS	0.002	0.005	0.400	-0.007	0.011	0.688	
	ACEs x DERS	0.001	0.002	0.750	-0.002	0.005	0.454	R^2 = 0.098
5	Intercept	5.357	0.088	61.060	5.183	5.532	< .001	
	SES index	0.076	0.102	0.740	-0.127	0.279	0.461	
	ACEs	-0.119	0.042	-2.860	-0.202	-0.036	0.005	
	PSI	0.009	0.005	1.990	0.000	0.018	0.050	
	ACEs x PSI	0.000	0.001	-0.160	-0.003	0.003	0.876	R^2 = 0.137
6	Intercept	5.332	0.088	60.360	5.177	5.536	< .001	
	SES index	0.068	0.105	0.650	-0.127	0.293	0.517	
	ACEs	-0.103	0.042	-2.460	-0.171	-0.002	0.016	
	BESS risk	0.008	0.010	0.790	-0.018	0.025	0.434	
	ACEs x BESS	0.002	0.003	0.680	-0.009	0.008	0.496	R^2 = 0.104
7	Intercept	5.386	0.082	65.850	5.223	5.549	< .001	
	SES index	0.075	0.101	0.750	-0.126	0.276	0.458	
	ACEs	-0.054	0.039	-1.370	-0.133	0.024	0.174	
	CCNES EE	0.002	0.085	0.020	-0.167	0.170	0.986	
	ACEs x EE	-0.122	0.043	-2.840	-0.208	-0.037	0.006	R^2 = 0.174

Multiple main effects of related variables on warmth with were found, as indicated by $p < .05$ at the point of intercept. For mothers with ACEs above, at, and below the mean, there is a difference in strength between some relevant variables and warmth. This differential impact of ACEs signals potential differences in the effect of ACEs by amount of adversity experienced in childhood.

The interaction of ACEs and CCNES Expressive Encouragement (EE) on warmth was significant, $b = -0.12$, SE = 0.043, $t(78) = -2.84$, $p < .05$, suggesting that ACEs moderate the association between observed parental warmth and mothers' self-reported use of encouraging their child to express negative emotions as a coping strategy. A simple slopes analysis showed that at the mean level of ACE scores, there was no association between EE and observed warmth. However, mothers who had high levels of ACEs showed a negative association, such that higher amounts of EE were related to lower observed warmth for these participants. Conversely, mothers who experienced fewer ACEs showed a positive association, with higher amounts of expressive encouragement associated with higher observed warmth. Figure 6, following below, plots the simple slopes for the interaction.

Figure 6

Simple Slopes for the Interaction of Expressive Encouragement by ACE Level



Note: CCNES expressive encouragement represents scores on a subscale of the Coping with a Child's Negative Emotions survey.

The CCNES Expressive Encouragement subscale contains items related to emotion validation ("I would tell my child it's OK to cry") as well as encouraging negative emotion ("I would encourage my child to express his/her feelings of anger and frustration"). These two categories of items may relate differently to maternal warmth, with emotion validation items possibly being more conducive to warm parenting practices. This difference in items might be a factor in how ACEs moderate the association between EE and observed warmth.

CHAPTER IV: DISCUSSION

This study used a strength-based, mixed methods approach to more deeply investigate the relationship between ACEs and parenting beyond the self-report measures that are commonly used in the literature. There was a significant negative relationship between exposure to adverse childhood experiences and displayed parenting behaviors, such that mothers who experienced higher levels of adversity and trauma as children displayed less observed parental warmth as an adult. Considering the importance of parental warmth in healthy development, this could hold significant implications for some mothers with trauma histories. These mothers may be more likely to display fewer warm parenting behaviors, potentially impacting their child's development and lifeways. Mothers with more ACEs likely face unique challenges in parenting, which should be recognized and directly addressed in service provision or parenting programs. This would encourage trauma-informed practices, and may contribute to more effective interventions.

Research question 1 examined the association between ACEs and warmth by operationalizing adverse childhood experiences in three different ways. ACEs were not significantly related to warmth when they were treated as a dichotomous presence/absence, but were significant when analyzed according to clinically indicated groups and as raw scores. Operationalizing ACEs using the raw score allowed for the truest representation of data. It is worth noting that a good portion of the literature has chosen to investigate the effect of ACEs on later outcomes using the dichotomous approach. As such, researchers may miss important effects of ACEs by using this type of approach. Clearly, inconsistency in measuring ACEs impacts findings and may influence results more than social scientists would like to admit. We need more consensus in the

field about how to best measure ACEs. The results of this dissertation suggest that, when possible, retaining the raw values is the recommended approach.

Statistical analyses did not show a significant relationship between ACEs and other observed parenting behaviors during the recorded parent-child interaction. This was surprising, especially because warmth-adjacent behaviors like cooperation did not have a significant association. Negative affect was almost significant in these examinations, which aligns with other study findings regarding the importance of affect and emotion. This result indicates that there may be something unique to trauma and warmth where the effects of trauma hold more implications for warm parenting behaviors as compared to other types of parenting behaviors. Trauma may increase certain symptoms which make it more difficult to express warmth, namely affect dysregulation, dissociation, and somatization (Van der Kolk et al., 1996). Biological influences related to trauma and toxic stress such as elevated cortisol levels and disrupted hypothalamic-pituitary-adrenal system functioning (Kuhlman et al., 2015) might also be at play.

Mixed methods analysis of two purposefully-selected groups of mothers with high ACEs who displayed one standard deviation above and below the means of warm behaviors in parent-child interactions revealed interesting themes for further study. A thematic difference in the observed bond between mother and child suggests that attachment between the mother and child might be an important variable. Attachment style and characteristics related to attachment might make it easier or harder to parent with warm behaviors. The importance of emotions also arose in the study in a few different ways. Socio-emotional content was present in all observations of mothers who displayed higher warmth, and in none of the observations of mothers who were rated as

lower warmth. Social-emotional learning and skills might be especially important in mitigating the effects of childhood trauma and adversity on parenting, and serve as a resilience factor. Building emotional intelligence through parenting may be an avenue for disrupting cycles of adverse childhood experiences. As an illustration of the synergistic benefits of mixed methodology, qualitative analysis regarding SEL indicated the potential key role of emotion in these relationships, and subsequent quantitative moderation analyses uncovered an interaction between ACEs and a parental coping strategy of encouraging the expression of emotion in how they function regarding warmth. These findings suggest that the way mothers impact their child's feelings and emotional understanding might moderate the effects of ACEs and parental warmth.

Qualitative analyses were used to motivate select exploratory qualitative analyses. Here, I found that more adverse childhood experiences were associated with more parenting stress, depression symptoms, emotional regulation challenges, and child risk of emotional or behavioral issues. This is consistent with previous research findings about the significant effects of ACEs on parenting stress and the impacts of trauma on later depression and parenting (Banyard et al., 2013; Crouch et al., 2019; Lange et al., 2019). The identification of difficulties in emotional regulation in mothers with higher ACE scores again highlights the importance of emotion in the ACE/warmth relationship.

Interestingly, the one self-report variable that significantly moderated the association between ACEs and warmth was expressive encouragement as reported on the CCNES. This variable captures the degree to which mothers claim that they would encourage their child to express negative affect or validate children's emotional states. We found that, in our sample, mothers who were high in expressive encouragement

showed a significant negative association between ACEs and warmth. While there is a strong possibility that this is a spurious association due to the exploratory nature of these analyses, it may also indicate that use of expressive encouragement among parents with high ACEs could have counterintuitive effects on other aspects of parenting.

In this community sample of mothers, we still saw a prevalence of ACEs including those with four or more adverse events. Although mothers were not presenting with any clinical issues, they might still be experiencing deleterious effects from exposure to adversity or trauma. It is therefore important to recognize potential impacts from trauma within a general population, rather than only those who might be labeled as high risk. Findings also demonstrated the importance of recognizing the impact of context and environment in parenting, especially the influence of SES. The relationship between ACEs, SES, and parenting is complex and likely complicated by multidirectional influences and shared variance. An analysis of national data showed that 15-20% of the association between ACEs and health risk could be attributed to SES alone (Font & Maguire-Jack, 2016). The impact of SES on both childhood adversity and parenting should be carefully considered in theoretical models and addressed in statistical analyses. Research in ACEs and parenting benefit from an intersectional, contextual approach that includes socio-cultural environments, controls for the effects of SES, and accounts for different levels of resource.

Limitations

As this research project used secondary data analysis, I was limited in my ability to design this study. Qualitative analysis indicated other potential variables and avenues to explore, but I was only able to incorporate measures which had already been

administered. For example, I would have opted to explore the group differences I identified between low and high warmth mothers use of SEL language using quantitative measures designed to capture such parenting behaviors, such as the Parent Emotion Regulation Scale (PERS; Pereira et al., 2017). The study's cross-sectional design also impacts interpretability, as a longitudinal design is considered a gold standard in ACEs and parenting research.

Using a community sample of participants conferred a number of benefits to the study, but also created some challenges in analysis. There were fewer participants who displayed low warmth during recorded parent-child interactions, which may be a result of working with a non-clinically referred population. A lack of abundant data on mothers who display lower warmth behaviors might have promoted more statistical leverage for the existing data, disrupting assumptions of certain statistical tests. The range of the warmth variable was also restricted, and even the lowest levels of warmth in the data did not reach the lowest two PARCHISY scores. This may have also affected the significance of various findings, especially for effects that were in the hypothesized direction but did not show statistical significance. The sample also showed a lack of diversity in the racial/ethnic and class backgrounds of participants, which holds implications for generalizability. As parenting practices can be quite culturally bound, including participants from culturally diverse backgrounds is of special importance in studying these topics (Maguire-Jack, Lanier, & Lombardi, 2020).

Social desirability bias likely impacted observed parental behaviors, and motivated mothers to display more supportive practices in video recorded interactions than they typically would. The denied request task was added to parent-child interactions

to increase conflict, but the data still had low base rates for observed negative affect and negative control. This may have led to non-significant findings related to unsupportive parenting behaviors. Although the displayed parenting behaviors might be different than what parenting usually looks like at home or in more private settings, they may still be indicative of what the participant believes to be the most desirable parenting behaviors. For example, even if a mother who repeatedly prompted her child for academic content in the recorded interactions might not act this way in her day-to-day life, she probably believes that desirable parenting practices include academic content or behaviors relating to school readiness. Therefore, although observing and recording interactions likely influenced the validity of parenting behaviors, they might be more aligned with the mothers' beliefs about what parenting should look like.

Conclusions and future directions

Childhood trauma and adversity can have lasting impacts which extend to parenting as an adult. Parental warmth is a salient, nuanced variable in this relationship, and future research would benefit from capturing warmth through more applied and creative means. Research designs that incorporate more multigenerational approaches and participant dyads might also enhance our scientific understanding of these important topics.

Study findings support the Centers for Disease Control (CDC) and Prevention's promotion of safe, stable, nurturing relationships (SSNRs) and environments as its key strategy in preventing child maltreatment at a public health population level (CDC, 2014). Caregivers who experienced adversity in childhood may show less warm behaviors as a parent, thereby making it more difficult to sustain a nurturing relationship

with their child. This could lead to non-optimal childhood development, suggesting more negative outcomes and a higher potential for intergenerational transmission of trauma through parenting practices. This also highlights a need for more targeted, trauma-informed parenting interventions, particularly for caregivers with high ACE scores and lower displayed warmth. Parenting interventions typically aim to enhance parenting by increasing supportive parenting, decreasing harsher parenting, and reducing parental stress (Lindstrom Johnson et al., 2018). Mothers who have more experiences with adversity or trauma might specifically benefit from more curriculum or strategies focused on bolstering supportive parenting behaviors.

A possible avenue for further exploration is a closer examination of how different types of adverse childhood events might be associated with parenting practices. Research findings have demonstrated that individual events can show a differential impact, especially between domains of maltreatment and household dysfunction (Negriff, 2020). Certain ACE items might be more related to relationships or parenting than others, and have a more substantial impact on warmth behaviors. The adverse childhood experience of sexual abuse has been shown to have distinct relationships with certain outcomes and be more inter-related to other ACE events (Dong et al., 2003). ACE events can also vary in severity or degree of exposure, with more intense experiences such as penetrative sexual abuse being related to a lower quality of life (Downing, Akinlotan, & Thornhill, 2021). ACEs are not monolithic, and further research should examine differences in impact by type and severity.

Emergent findings regarding the importance of feelings and emotion-related variables warrant further study. An evidence-based intervention package designed to

address childhood adversity in schools used an enhanced SEL curriculum to effectively buffer risk associated with social-emotional distress and school bonding (Sanders et al., 2020). Furthering SEL and emotional skill may present an opportunity to mitigate the effects of ACEs. The way in which parents understand, express, and communicate about emotions may be particularly important in bolstering more warm parenting behaviors. Future research should be performed to better understand the role of emotion in parenting with higher exposure to childhood adversity and trauma, especially the fruitfulness of targeting socio-emotional skill building in interventions.

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