


Regular Article

Effects of adverse childhood experiences on observed parenting and children's behavior problems among Jewish and Arab Muslim families in Israel

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Abstract

Research points to the substantial impact of parents' exposure to adverse childhood experiences (ACEs) on parents and their children. However, most studies have been conducted in North America, and research on ACEs effects on observed parenting or on intergenerational transmission of ACE effects is limited. We therefore studied families from diverse ethnocultural backgrounds in Israel and examined whether mothers' ACEs hampered maternal sensitivity and the quality of the home environment and whether mothers' psychological distress mediated these links. We also explored whether mothers' ACEs predicted children's behavior problems indirectly through maternal psychological distress and whether maternal sensitivity and the home environment attenuated this mediating path. Participants were 232 mothers ($M_{\text{child age}} = 18.40$ months, $SD = 1.76$; 63.36% non-ultra-Orthodox Jewish, 17.24% ultra-Orthodox Jewish, 19.40% Arab Muslim). Results showed mothers' ACEs were directly associated with decreased maternal sensitivity. Mothers' ACEs were indirectly associated with more behavior problems in children through mothers' higher psychological distress, and maternal sensitivity moderated this indirect link; it was significant only for mothers who showed lower sensitivity. Findings emphasize the significant role ACEs play in early mother-child relationships. The importance of including ACE assessment in research and practice with families of infants and toddlers is discussed.

Keywords: adverse childhood experiences; child behavior problems; maternal sensitivity; psychological distress; home environment

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Exposure to an accumulation of adverse childhood experiences (ACEs) of abuse, neglect, and family dysfunction predicts poorer physical and mental health in adulthood (Felitti et al., 1998; Hughes et al., 2017). Furthermore, the children of parents who were exposed to a larger number of ACEs are at risk of increased behavior problems (Cooke et al., 2019, 2021). Yet most studies of the intergenerational effects of parents' ACEs have been conducted in North America, and the generalizability of their findings to other countries and cultures is limited (Cooke et al., 2021). In addition, the effects of ACEs on parenting and the pathways by which parents' ACEs affect their parenting and their children's behavior problems have received relatively little attention (e.g., Harris et al., 2021).

To begin to address these gaps, we focused on mothers and their infants and toddlers from three ethnocultural groups living in Israel: non-ultra-Orthodox Jewish, ultra-Orthodox Jewish, and Arab Muslim. We studied whether mothers' ACEs would be associated with children's behavior problems and two aspects of parenting known to have a profound impact on development: maternal sensitivity, which reflects mothers' appropriate and prompt responsiveness to their children during interactions

(Tarabulsy et al., 2009), and the home environment, measured as the quality and quantity of stimulation, support, and structure mothers provide their children (Caldwell & Bradley, 2016). To shed light on the process by which the accumulative effects of parents' ACEs may occur, we examined whether mothers' psychological distress mediated these associations. We also explored whether maternal sensitivity and a better home environment would buffer the mediated link between mothers' ACEs and children's behavior problems.

This type of research can illuminate the universality of the consequences of parents' ACEs and the mechanisms by which parents' ACEs shape the development of their offspring. As such, it may guide prevention and early intervention efforts to break the intergenerational transmission of adversity and trauma.

ACEs

In 1998, Felitti and colleagues published their seminal epidemiological study on the detrimental effects of exposure to an accumulation of ACEs (Felitti et al., 1998). The researchers surveyed clients of one of the largest health care companies in the United States for ten ACEs, reflecting childhood maltreatment of abuse (i.e., physical, emotional, and sexual abuse) and neglect (i.e., emotional and physical neglect), as well as household dysfunction (e.g., mental illness in the household, exposure to substance abuse in the household). The researchers found that

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ACEs increased the risk of poor physical and mental health conditions in adulthood in a dose-response fashion (Felitti *et al.*, 1998).

Subsequent studies gave further evidence of the lifelong additive effects of exposure to multiple ACEs (Felitti & Anda, 2010). ACEs were found to be associated with physiological changes in the immune, endocrine, cardiovascular, and nervous systems and to affect inflammatory and metabolic functioning, as well as brain structure and functioning (see meta-analysis in Cooke *et al.*, 2023). As such, ACEs take a toll not only on health but also on the ability to function at cognitive, social, and emotional levels (Hales *et al.*, 2022; Hughes *et al.*, 2017). Studies consistently show that exposure to a higher number of ACEs is predictive of health-harming behaviors (e.g., Bellis *et al.*, 2014), physical diseases, higher rates of mortality, increased psychological distress and psychopathology, lower educational attainment, and poorer socioeconomic outcomes (see meta-analyses in Hales *et al.*, 2022; Hughes *et al.*, 2017).

Parents' ACEs, parenting, and children's adjustment

In light of these pervasive effects, it is not surprising that ACEs also influence the next generation. Children whose parents were exposed to higher numbers of ACEs are at increased risk of poorer health and reduced social-emotional adjustment, particularly increased behavior problems from infancy (Madigan *et al.*, 2017) through adolescence (Doi *et al.*, 2022; see meta-analysis in Cooke *et al.*, 2021). To deepen the understanding of these associations, researchers have begun to explore pathways underlying these effects, and suggested mothers' psychological distress as a potential mediating mechanism (e.g., Zhang *et al.*, 2023). Psychological distress may shape mothers' emotional expressions and social behaviors, and these, in turn, might be modeled by the child. In addition, mothers' psychological distress may hamper mothers' marital relationships and other family and non-familial social relationships, with negative effects on children's behavior (Connell & Goodman, 2002). Supporting these notions, a few studies have found an indirect link between mothers' ACEs and children's behavior problems via mothers' elevated psychological distress (Cooke *et al.*, 2019; Doi *et al.*, 2022; Rieder *et al.*, 2019; Zhang *et al.*, 2023). Except for one study in Japan (Doi *et al.*, 2022) and another in Kenya (Rieder *et al.*, 2019), however, results were obtained in research conducted in the US and Canada, thus limiting their applicability to other cultural contexts (Cooke *et al.*, 2021).

Parenting is also considered to be a central mechanism in the intergenerational transmission of ACEs' effect. ACEs may shape parenting in different direct and indirect ways. They may diminish the set of skills parents have and lead to distorted expectations of parenting and to distorted beliefs about how to scaffold the interactions with the child and create a developmentally appropriate environment that fosters child development (Sheffield Morris *et al.*, 2021). Furthermore, parents' experiences as children with their parents are thought to shape their mental representations of attachment and caregiving relationships, and these, in turn, guide their caregiving to their child (Crowell *et al.*, 2010). A higher number of experiences of witnessing or experiencing abuse and a lack of emotional support from parents due to neglect or family dysfunction might lead to more negative and disorganized mental representations; parents may not be aware of these, but they are likely to color their interpretations of their child's signals and their behavioral responses to the child (Crowell *et al.*, 2010; Murphy *et al.*, 2014; Thomson & Jaque, 2017). The increased risk of psychological distress associated with ACEs

(Hales *et al.*, 2022) may also impede parents' ability to self-regulate and remain emotionally available to their child, particularly when the child is distressed. This, in turn, may hamper the development of the child's self-regulation skills and lead to increased behavior problems (Cooke *et al.*, 2019). At the same time, however, when parents, despite childhood adversities, succeed in providing sensitive caregiving, it may mitigate the negative effects of their child's exposure to adversities in the family, such as those related to parental psychological distress (Narayan *et al.*, 2023).

Numerous studies suggest childhood maltreatment, one of the two core ACE types, is associated with an increased risk of abusive or neglectful parenting, insensitive caregiving, and poorer child-rearing practices (see a review in Greene *et al.*, 2020 and a meta-analysis in Madigan *et al.*, 2019). However, relatively few studies have examined the effects of cumulative ACEs on parenting (for a review, see Zhang *et al.*, 2022), and these have had mixed results. While some found mothers' multiple ACEs were associated with self-reports of poorer parenting, directly or indirectly through mothers' psychological distress (Doi *et al.*, 2022; Racine *et al.*, 2018; Sheffield Morris *et al.*, 2021; Yoon *et al.*, 2019), others did not find significant links (Thomas-Giyer & Keesler, 2021) or found evidence of such associations in some countries but not others (Brown *et al.*, 2021).

Furthermore, only a small number of studies have gone beyond parents' self-reports of their parenting to evaluate the effects of ACEs on the quality of mother-child observed interactions, and these also yielded inconsistent results. One found mothers' ACEs were associated with lower emotional availability (i.e., maternal sensitivity, structuring, non-intrusiveness, non-hostility; Biringen *et al.*, 2014), but only when children were 18 months old, not when they were 60 months old (Harris *et al.*, 2021). Two others did not find significant links between mothers' ACEs and maternal sensitivity towards their infants (Coe *et al.*, 2020) or emotional availability towards their preschoolers (Ziv *et al.*, 2018). Additional studies have reported that mothers' ACEs indirectly led to lower maternal sensitivity, through its effect on mothers' incoherent narratives on childhood attachment experiences (Crowell *et al.*, 2010) and increased psychological distress (Bouvette-Turcot *et al.*, 2020). Finally, a recent study showed that although mothers' ACEs were not associated with their emotional availability, they were indirectly associated with children's behavior problems via mothers' psychological distress, and this mediated path was moderated by mothers' emotional availability; it was significant for mothers who showed low emotional availability but not for those who showed high emotional availability (Wurster *et al.*, 2020). Given the inconsistent findings, further research on the relations between mothers' ACEs and observed mother-child interactions is called for.

Another core aspect of observed parenting known to have a significant effect on children's development that is possibly affected by ACEs is the home environment (see a review in Bradley, 2015). An adequate home environment includes developmentally appropriate home transactions (e.g., avoiding harsh punishment), experiences with objects (e.g., toys and books), events (e.g., visiting family and friends), and arrangements (e.g., being taken regularly to the doctor; Bradley, 2015). Parents who experienced abuse, neglect, and family dysfunction as children may unintentionally provide their own children with an inadequate home environment. This link could be indirect via parental psychological distress. At the same time, if parents manage to provide an adequate home environment, it may protect the child from the effects of exposure to negative experiences in the family, such as exposure to elevated

parental distress. Studies outside the realm of ACE research have indicated that parental psychological distress is associated with less adequate home environments (Bradley, 2015). Yet we are aware of only one study on the associations between ACEs and the home environment. The study assessed mothers' childhood experiences of maltreatment and neglect, but not family dysfunction, and did not find support for either a direct association or an indirect link through mothers' psychological distress (Ammerman et al., 2012).

Overall, more studies on the effect of mothers' ACEs on maternal sensitivity, the home environment, and children's behavior problems and the processes by which these effects occur are needed, especially in a non-North American context. Our study begins to fill the gap.

The context of the study: ethnocultural groups in Israel

The study focused on mothers and children from three ethnocultural groups in Israel. The first group comprised non-ultra-Orthodox Jews, the majority in Israel. Members of this group adhere to individualist values of autonomy, equality, and self-fulfillment (Sher-Censor, 2015). The two additional groups were ultra-Orthodox Jews and Arab Muslims, who constitute 13.3% and 18.1% of the Israeli population, respectively (Israel Central Bureau of Statistics, 2023). The two groups are close-knit and follow collectivist, patriarchal, and authoritarian values (Gemara & Nadan, 2022; Mizrachi & Weiss, 2020). Marriage and transition to parenting occur at earlier ages than in the non-ultra-Orthodox Jewish group, and rates of single parenting and divorce are lower (Israel Central Bureau of Statistics, 2023).

Ultra-Orthodox Jews have intense religious beliefs and adhere to strict ritual laws and cultural mores. They reside in self-isolated communities and neighborhoods, maintain a separate educational system, isolate themselves from secular media, and strive to provide for their own needs using internal organizations to protect the religious Jewish heritage from secular influences. In many ultra-Orthodox families, women provide the primary financial support, as their spouses refrain from working and engage in full-time religious studies (Gemara & Nadan, 2022; Simhi et al., 2020).

The majority of Arab Muslims are self-defined as traditional religious or religious (Israel Central Bureau of Statistics, 2023). They reside in separate towns, villages, and neighborhoods and maintain a separate education system (Israel Central Bureau of Statistics, 2023). Arab Muslim communities are organized around patriarchal extended families (Mizrachi & Weiss, 2020). Yet this society is undergoing a process of modernization that involves a change of values towards an increased emphasis on autonomy and equality, including a gradual increase in women's empowerment (Shoshana & Shchada, 2018).

There is little research on mother-child relationships and children's adjustment among ultra-Orthodox Jews and Arab Muslims (Feldman & Masalha, 2010; Sher-Censor et al., 2017, 2020; Zreik et al., 2017). Furthermore, past studies raised concerns about the tendency of both groups to conceal or ignore abuse, neglect, and family dysfunction, partly to protect family members from stigma and partly because of mistrust in social services (Nadan et al., 2019). Our study provided an opportunity to examine these understudied ethnocultural groups in a comparative context.

Study hypotheses

The aim of the study was to examine whether and how Israeli mothers' ACEs shape their parenting and their children's behavioral problems and explore the pathways by which these

effects occur. We examined two models. The first focused on parenting and hypothesized that mothers' exposure to more ACEs would be associated with lower maternal sensitivity and poorer quality of the home environment. We expected that these associations would be indirect, through mothers' psychological distress. The second model focused on children's behavior problems. We hypothesized that the link between mothers' ACEs and higher levels of children's behavior problems would be indirect through maternal psychological distress, and this indirect effect would be moderated by maternal sensitivity and the home environment. Specifically, we expected the link between mothers' psychological distress and children's behavior problems would be evident only when mothers showed lower sensitivity or provided their children with a poorer home environment. Finally, given the absence of prior relevant research on ultra-Orthodox Jews and Arab Muslims, we examined ethnocultural differences with no a-priori hypothesis.

Method

Participants

Participants were 232 Israeli mothers and their children, referred to a national early intervention project for parents at risk of providing poor parenting. In the sample, 63.36% of the mothers were non-ultra-Orthodox Jewish, 17.24% were ultra-Orthodox Jewish, and 19.40% were Arab Muslim. Mothers' ages ranged from 19 to 44 years ($Mean = 28.23$, $SD = 5.59$). Mothers' years of education ranged from 6 to 18 years ($Mean = 13.07$, $SD = 1.91$). Most mothers were married or cohabiting (65.95%). The average number of children in the family was 1.39 ($SD = .58$, $Range = 1-3$), and 50.86% of the children were female. Children's ages ranged from 1 to 36 months ($Mean = 18.40$, $SD = 10.76$). Thirty-one (13.36%) children had a medical (e.g., heart defects, hydrocephalus, developmental dysplasia of the hip) or developmental (e.g., language or developmental delay) diagnosis. Families were referred to the intervention for various reasons, including single parenting, living in extreme poverty, or mothers' reports of difficulty parenting the child or significant marital discord. Mothers with psychiatric diagnoses, those who were currently experiencing marital violence, and those who were identified by child protection services as neglecting or abusing their child were referred to other intervention programs and were excluded from the study.

Procedure

The study was part of larger longitudinal research evaluating the intervention project. Data presented herein were collected during 2020–2022, before mothers received the intervention. Information on ACEs was collected by therapists as part of the intake process. Research assistants collected mothers' self-reports, including reports on children's behavior problems and family demographics. A home visit was scheduled next to collect observational data. In line with the Home Observation for Measurement of the Environment (HOME) protocol (Caldwell & Bradley, 2016), visits were scheduled at a time when the mother was at the home and the child was awake. The home observation was conducted first. Then, mothers were asked to play with their child for 10 minutes, as they usually played, to evaluate maternal sensitivity. To maintain the blindness of the coders of the home observation to maternal sensitivity, the home observation was conducted before mother-child play interaction. Play interactions were videotaped and coded later by independent blind coders, except for 19 interactions that

were coded during the home visit, because mothers refused to be videotaped. Therapists and research assistants were native speakers of the native language of the family. Tasks were completed in the mothers' native language. The study was approved by the institutional review board of the University of Haifa (Approval #424/19).

Measures

Maternal ACEs

Therapists used the widely used *Adverse Childhood Experiences Checklist* (Center for Disease Control, 2016; Felitti *et al.*, 1998) to ask mothers, as part of the intake interview, whether before the age of 18 years, they experienced the following 10 ACEs: physical abuse, emotional abuse, sexual abuse, physical neglect, emotional neglect, parental separation or divorce, domestic violence, addictions in the household, mental illness in the household, or incarceration of a member of the household. Scores were calculated by adding the total number of "yes" responses.

Maternal sensitivity

The *Maternal Behaviour Q-sort - Short Version* (MBQS; Tarabulsy *et al.*, 2009) was used to assess maternal sensitivity. The 25-item MBQS is an adaptation of the original 90-item Maternal Behaviour Q-sort (MBQ; Pederson & Moran, 1996). It is designed to code maternal sensitivity from video recorded or live interactions. Trained coders rated 25 items describing mothers' appropriate and warm responses to the child (e.g., "Respects child as an individual, i.e., able to accept child's behaviour even if it is not consistent with her wishes"). Coding involved sorting the items into five piles, with five items placed in each pile. Piles ranged from most to least characteristic of the mother, yielding a score of 1–5 for each item.

The sensitivity score of each mother was calculated based on the correlation between the mother's sort scores and the criterion sort of the prototypically sensitive mother provided by the developers of the MBQ (Pederson & Moran, 1996; Tarabulsy *et al.*, 2009). Thus, scores could theoretically range from –1.00 to 1.00. A higher correlation reflected that the mother was more sensitive. The validity of the MBQ and MBQS has been supported in several studies (e.g., Booth *et al.*, 2023), including among Arab-Israeli families (Zreik *et al.*, 2017). To establish reliability in the current study, 32% of the interactions were rated by two independent blind coders. The average correlation between the two coders' arrays of scores was .83 ($SD = .10$, $range = .50–1.00$). Disagreements between coders were resolved through discussion.

The home environment

To assess the home environment provided by the mothers, we used the *HOME* (Caldwell & Bradley, 1976, 2016). The HOME combines a natural home observation with a parental interview. The infant and toddler version of the HOME used in this study includes 45 items tapping six domains: (1) mothers' responsiveness to the child (e.g., "Parent spontaneously vocalizes to child at least twice"); (2) mothers' acceptance of the child (e.g., "Parent does not scold or criticize the child during the visit"); (3) organization of the child's environment in terms of a safe physical environment and regular and predictable schedule (e.g., "Child's play environment is safe"; "Child is taken regularly to doctor's office or clinic"); (4) provision of appropriate play and learning materials that can stimulate child development (e.g., "Push or pull toys are available to the child"); (5) maternal involvement in child learning (e.g., "Parent keeps child in visual range, looks at often"); and

(6) variety or the extent to which mothers include a variety of people and events in the child's daily life (e.g., "Family visits relatives or receives visits once a month or so"). Observers rated each item as 1 ("yes") or 0 ("no"), and scores were summed. Higher scores reflected a better home environment.

The HOME has been used in numerous studies, including in Israel (e.g., Schwartz & Bilsky, 1990). Cronbach's alpha of the HOME items in our study was good, $\alpha = .82$. Blind research assistants conducted and coded the HOME. As part of their training, they achieved at least 90% agreement on five mother-child pilot cases. To ensure coders' reliability, seven (5.98%) home visits were conducted by pairs of blind research assistants. Interrater reliability of their HOME scores was excellent (Intraclass Correlation Coefficient = .99). Coding disagreements were resolved by consensus.

Children's behavior problems

Mothers were invited to complete the Problem Scale of the *Brief Infant Toddler Social Emotional Assessment* (BITSEA; Briggs-Gowan & Carter, 2006). The scale assesses social-emotional problems of toddlers aged 12–36 months (Briggs-Gowan & Carter, 2006). It includes 31 items tapping externalizing and internalizing problems, dysregulation, maladaptive behaviors, and atypical behaviors (e.g., "Seems nervous, tense, or fearful"; "Is destructive. Breaks or ruins things on purpose"). Mothers were asked to rate their child's behavior in the last month on a scale ranging from 0 ("not true/rarely") to 2 ("very true/often"). For some items, an option of N ("no opportunity") is available. The scale showed good internal consistency (Cronbach's $\alpha = .79$). Scores were summed, with higher scores reflecting more behavior problems.

Maternal psychological distress

Mothers completed the Depression and Anxiety scales of the *Depression, Anxiety and Stress Scale - 21 Items* (DASS-21; Lovibond & Lovibond, 1995) to assess their psychological distress. They rated the extent to which they experienced seven symptoms of depression (e.g., "I felt down-hearted and blue") and seven symptoms of anxiety (e.g., "I felt scared without any good reason") over the past week on a 4-point Likert scale ranging from 0 ("does not apply") to 3 ("applies very much"). Scores on each scale were summed. The scales demonstrated good internal consistency (Cronbach's $\alpha_{\text{Depression}} = .82$; Cronbach's $\alpha_{\text{Anxiety}} = .82$). The DASS is widely used, including in its Hebrew and Arabic versions (e.g., Ali *et al.*, 2017; Sher-Censor *et al.*, 2020). It was used in previous Israeli research on ultra-Orthodox Jews (Sher-Censor *et al.*, 2020) and Arab Muslims (e.g., Alfayumi-Zeadna *et al.*, 2022). Depression and anxiety scores were significantly and strongly correlated ($r = .66$, $p < .001$) and thus were averaged to form mothers' psychological distress. Higher scores reflected higher psychological distress.

Missingness and analytic plan

Percentage of missing questionnaire data due to technical errors ranged from 1.29% for marital status to 7.33% for mothers' years of education. In addition, as the minimal age for which the BITSEA is valid is 12 months, 73 mothers (31.47%) whose children were younger than 12 months did not report their child's behavior problems. These families did not differ from families with a child aged 12 months and up in any of the background variables (all $ps > .098$) except for the number of children in the family. Families with children older than 12 months had more children

($Mean = 1.53, SD = .64$) than families with children younger than 12 months ($Mean = 1.10, SD = .30$), $t(164.23) = 5.88, p < .001$.

Due to resource limitations, only 50% of the participating families, selected randomly, were visited at home. Accordingly, maternal sensitivity was observed for 123 families (53.02%). HOME observations were collected for 107 of these 123 families (46.12%). The remaining 16 families (6.90%) joined the intervention during periods of COVID-19 lockdowns, so a home visit could not be conducted. For these families, maternal sensitivity was recorded via a Zoom meeting. Families who did not participate in the maternal sensitivity assessment did not differ from those who participated in any background variables (all $ps > .064$) except for one unexpected difference. Mothers who did not participate in the maternal sensitivity assessment had fewer years of education ($Mean = 12.61, SD = 1.87$) than mothers who participated ($Mean = 13.41, SD = 1.87$), $t(213) = 3.08, p = .002$.

Preliminary analyses involving correlations, t-tests, and ANOVA informed the inclusion of background variables in hypotheses testing. Descriptive statistics for the prevalence of each ACE were examined next, followed by correlations analysis to determine whether the conditions for models with indirect effects were met, namely a significant link between mothers' ACEs and psychological distress and between psychological distress and the outcome variables (maternal sensitivity, home environment, children's behavior problems). If the conditions were not met, subsequent mediation analysis was not performed. A regression analysis was conducted instead to examine whether the bivariate link between mothers' ACEs and the outcome variable was significant when controlling for ethnocultural background and relevant covariates identified in the preliminary analyses. If the conditions for models with indirect effects were met, mediation and moderated mediation models were analyzed using Hayes's (2018) SPSS PROCESS routine. This routine estimates the significance of indirect effects with a bootstrap approach, more specifically, a nonparametric method based on repeated random resampling with replacement, yielding 95% bootstrapped confidence intervals (CIs) for the indirect effect. A significant indirect effect is evident when zero is outside the 95% CIs, indicating the mediation effect is statistically different from zero at $p < .05$. Continuous variables were centered, and analyses controlled for ethnocultural background and relevant demographic variables.

Results

Preliminary analyses

The distribution of all variables was sufficiently normal to render parametric statistics valid (Afifi et al., 2007). Descriptive statistics of study variables are shown in Table 1.

Background and study variables did not vary by ethnocultural group (all $ps > .210$), except for two differences, which were expected and in line with reports of the Israeli Central Bureau of Statistics (2023). First, single-parent status was more prevalent among non-ultra-Orthodox Jewish mothers than among ultra-Orthodox Jewish and Arab Muslim mothers, $\chi^2(2) = 13.04, p < .001$. Second, non-ultra-Orthodox Jewish mothers were older ($M = 29.93, SD = 5.92$) than ultra-Orthodox Jewish mothers ($M = 24.89, SD = 2.73, p < .001$) and Arab Muslim mothers ($M = 25.37, SD = 3.44, p < .001$; $F[2, 222] = 22.58, p < .001$). It should be noted that maternal years of education and the home environment also varied by ethnocultural background, $F(2, 212) = 3.03, p = .050$ and $F(2, 104) = 3.77, p = .026$ respectively.

Table 1. Descriptive statistics of study variables

	N	Mean / n	SD / %	Range
Mothers' ACEs	232	2.56	2.52	0–10
0		64	27.59	
1		42	18.10	
2		27	11.64	
3		24	10.34	
4 or more		75	32.33	
Mothers' psychological distress	219	3.24	3.23	0–37
Maternal sensitivity	123	.59	.36	-.89–.91
Home environment	107	35.27	5.69	20–45
Children's behavior problems	142	12.25	6.53	0–34

Yet none of the post hoc comparisons was significant ($ps > .051$ and $ps > .108$, respectively).

There were no significant associations between other background variables and the study variables (all $ps > .081$), except for the following. Mothers who reported more ACEs had fewer years of education ($r = -.25, p < .001$). Older mothers and children, as well as more years of education, were associated with better HOME scores ($r = .36, p > .001, r = .32, p < .001$, and $r = .26, p = .007$ for older mothers, older children, and more education, respectively). Finally, mothers of boys ($Mean = 13.87, SD = 6.84$) reported more child behavior problems than mothers of girls ($Mean = 10.67, SD = 5.83$), $t(140) = 3.01, p = .034$.

Mothers' age was significantly related to two covariates: ethnocultural background (mentioned above) and mothers' years of education ($r = .23, p < .001$). Therefore, to minimize collinearity concerns, we did not include maternal age in further analyses. In accordance with the preliminary analyses, ethnocultural background, mothers' years of education, child age, and child gender were included as covariates in subsequent analyses.

Prevalence of mothers' ACEs

As shown in Table 1, mothers reported, on average, 2.56 adverse experiences. The majority (72.41%) experienced at least one ACE and a third (32.33%) reported four or more ACEs. As can be seen in Figure 1, the most frequently reported ACEs were emotional abuse and emotional neglect. The least frequently reported were physical neglect and an incarcerated relative.

Predicting mothers' psychological distress, maternal sensitivity, home environment, and children's behavior problems from mothers' ACEs

Correlation analyses

As shown in Table 2 and in line with the study's hypothesis, mothers who experienced more ACEs reported increased psychological distress, showed lower sensitivity during play interactions, provided a poorer home environment, and reported more child behavior problems. As hypothesized, mothers' psychological distress was associated with their reports of more child behavior problems. Unexpectedly, mothers' psychological distress was not significantly correlated with their sensitivity to the child or with the home environment. Thus, there was no justification for examining the mediating role of mothers'

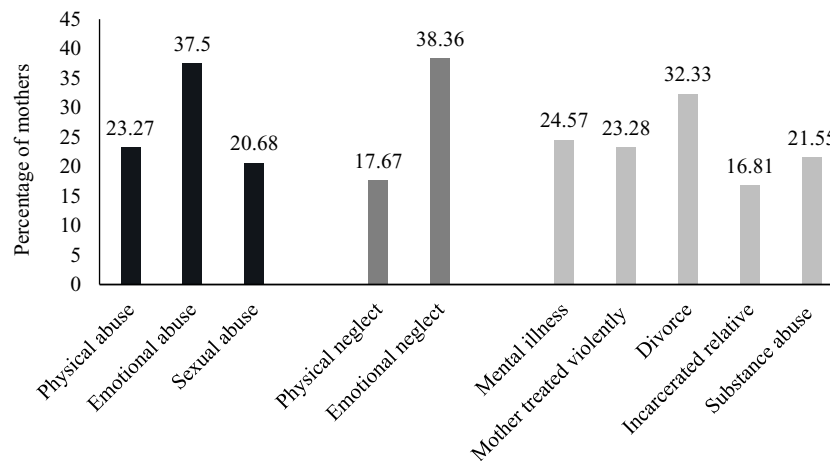


Figure 1. Percentage of mothers' adverse childhood experiences in the sample ($N = 232$).

psychological distress in the links between mothers' ACEs and their sensitivity and the home environment.

Regression analyses

We ran two regression analyses to predict mothers' sensitivity and the home environment from mothers' ACEs while controlling for ethnocultural background and relevant covariates identified in preliminary analyses. Ethnocultural background was included as two dummy variables, Jewish/Arab and ultra-Orthodox/non-ultra-Orthodox. Psychological distress was included as a covariate because, as noted above, it was significantly correlated with mothers' ACEs. As hypothesized, the regression predicting maternal sensitivity indicated that after controlling for mothers' ethnocultural background, years of education, and psychological distress, which were entered in the first block ($\Delta R^2 = .03$, $F_{(4,113)} = 0.97$, $p = .426$), mothers' increased ACEs predicted lower maternal sensitivity ($\Delta R^2 = .05$, $F_{(1,112)} = 6.47$, $p = .012$, $\beta = -.24$, $t = -2.54$, $p = .012$).

Unexpectedly however, the second regression predicting the home environment indicated that after controlling for mothers' ethnocultural background, years of education, psychological distress, and child age, which were entered in the first block ($\Delta R^2 = .27$, $F_{(5,96)} = 7.19$, $p < .001$), mothers' ACEs did not significantly predict the home environment ($\Delta R^2 = .003$, $F_{(1,95)} = .46$, $p = .501$, $\beta = -.06$, $t = -.68$, $p = .501$).

Moderated mediation analyses

Finally, to examine the hypothesis that mothers' ACEs would be indirectly associated with their reports of their children's behavior problems via mothers' psychological distress, and this indirect pathway would be moderated by mothers' sensitivity and the home environment, we conducted two PROCESS analyses of moderated mediation (model 14). Analyses included the two dummy variables of ethnocultural background (Jewish/Arab, ultra-Orthodox/non-ultra-Orthodox), mothers' years of education, and child gender as covariates. As shown in Figures 2 and 3, and in line with our hypothesis, the first analysis supported a moderated mediation effect ($N = 80$, $b = -.62$, 95% percentile CI $[-1.73, -0.03]$). The link between mothers' ACEs and higher levels of children's behavior problems was indirect through mothers' psychological distress, but only for mothers with 1SD below the average sensitivity scores ($b = .33$, 95% percentile CI $[0.02, 0.92]$), not for

mothers with average or above average sensitivity scores ($b = .11$, 95% percentile CI $[-0.06, 0.39]$; and $b = -.08$, 95% percentile CI $[-0.38, 0.15]$ respectively). It should be noted that the direct link between mothers' ACEs and child behavior problems was significant (see Figure 2), indicating a partial mediation effect of mothers' psychological distress.

The second model examining the moderating role of the home environment in the indirect pathway between mothers' ACEs and child behavior problems via mothers' psychological distress suggested the moderating effect was not significant ($N = 67$, $b = -.01$, 95% percentile CI $[-0.08, 0.01]$).

Discussion

To the best of our knowledge, this was the first large-scale study in Israel to examine adults' ACEs and their effects. The study focused on mothers who were referred to early intervention to improve their parenting. In our study, less than a third of the mothers reported they did not experience any ACEs. A third reported four or more ACEs, a score that is often used clinically as a cutoff point reflecting a high risk for poorer physical and mental health (Felitti et al., 1998; Hughes et al., 2017). The high rate of ACEs among mothers in our study is similar to that documented for Head Start parents in the US (Randell et al., 2015). This could be expected, as parents in both cases were considered at risk in terms of their ability to provide nurturing conditions for their child's development. Yet, these rates are considerably higher than those typically reported in epidemiological and general population research in North America and Europe, i.e., 30%–60% with no ACEs and 7%–15% with four or more ACEs (Bellis et al., 2014; Racine et al., 2018). It should be noted, however, that similarly high rates were found in the general population of females and males in Saudi Arabia (Almuneef et al., 2016) and in expectant mothers in middle-income countries (Brown et al., 2021), although both studies utilized extended ACE self-reports. An epidemiological study among the general population in Israel is needed for a better understanding of the rates documented in our research.

ACEs and maternal sensitivity

Our research was among the first to examine the effects of ACEs on parenting outside North America and to extend research beyond mothers' self-reports to include observations of mothers'

Table 2. Inter-correlations of study variables

	1	2	3	4	5
1. Mothers' ACEs	–	.19**	-.19*	-.20*	.32**
2. Mothers' psychological distress	–		.17	-.10	.24**
3. Maternal sensitivity	–			.32**	-.20
4. Home environment	–				-.18
5. Children's behavior problems	–				

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

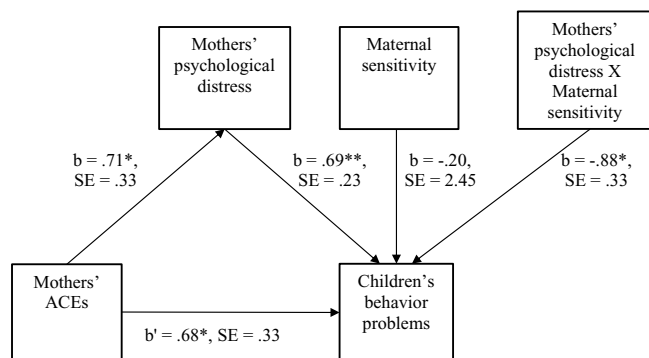


Figure 2. Indirect effects between mothers' adverse childhood experiences (ACEs) and children's behavior problems through mothers' psychological distress, conditional on mothers' sensitivity ($N = 80$). b = unstandardized beta coefficient of the path between variables. b' = unstandardized beta coefficient of the direct path between maternal ACEs and children's behavior problems. SE = standard error. Covariates include ethnocultural background, mothers' education, and child gender. * $p < .05$. ** $p < .01$.

sensitivity during mother-child play interactions. Results indicate that maternal sensitivity plays a central role in the effects of ACEs on parents and their children. In our study, mothers' exposure to multiple ACEs was related to lower maternal sensitivity towards the child. That is, mothers with increased ACEs tended to conduct less synchronous play interactions and were less attuned to their child's signals and pace. They provided less appropriate structuring of their children's attention and behavior and showed lower acceptance of their children's behaviors that were not consistent with maternal wishes (Tarabulsky et al., 2009).

Numerous studies have suggested maternal sensitivity has enduring effects on various aspects of children's development. These include brain morphology (Bernier et al., 2019), the formation of secure attachment (see a review in Zeegers et al., 2017), language development (Bornstein et al., 2020), and socioemotional adjustment (Raby et al., 2015). Our study joins research efforts to identify mechanisms that shape maternal sensitivity and suggests the accumulation of ACEs may be a factor underlying this aspect of parenting.

Following the study of Bouvette-Turcot and colleagues (2020), we expected that ACEs' effects on maternal sensitivity would be mediated by mothers' psychological distress. However, we did not find support for this indirect link. Mothers' ACEs were linked to poor maternal sensitivity above and beyond their psychological distress. These results emphasize the important role of ACEs in sensitive parenting. Future research examining other potential mechanisms that may underlie the impact of maternal ACEs on maternal sensitivity may help to guide prevention and early

intervention efforts in mothers exposed to multiple ACEs. These mechanisms may include changes in mothers' nervous and endocrine systems that are shaped by ACEs (see a review in Cooke et al., 2023), found by past studies, outside the realm of ACE research, to be related to insensitive parenting (see a review in Bos, 2017). Other potential mediators are mothers' knowledge of child development and their child-rearing attitudes. These factors are thought to be associated with quality of parenting (Bornstein et al., 2010), and a previous study found child-rearing attitudes were related to mothers' ACEs (Sheffield Morris et al., 2021). If knowledge of child development and child-rearing attitudes indeed mediate ACEs' effects on maternal sensitivity, they may be relatively easily targeted in parental interventions.

ACEs, maternal sensitivity, and children's behavior problems

Importantly, our findings suggest mothers' sensitivity plays a central buffering role against the transmission of ACEs' effects to the next generation. Consistent with results in North America (Cooke et al., 2021; Zhang et al., 2023), we found Israeli mothers' exposure to multiple ACEs was associated with increased behavior problems in their children as early as toddlerhood, and this link was mediated by mothers' higher psychological distress. Furthermore, similar to Wurster and colleagues (2020), we found the mediation was conditional on mothers' sensitivity. Although our study did not have a longitudinal design, and causal interpretations are tentative, our results shed light on the possible process by which early adverse experiences may shape children's wellbeing. Our study suggests that increased ACEs may lead to elevated maternal psychological distress, but mothers' sensitivity may buffer the effects of their psychological distress on the emergence of behavior problems in their toddlers. That is, when mothers can, despite their distress, be available to their child, attuned to the child's needs, and set clear and consistent limits, the child may not develop behavior problems. When mothers are distressed and less sensitive, the child may lack the necessary parental emotional support, scaffolding, and limit-setting and develop more behavior problems.

It should be noted that the direct effect of mothers' ACEs on children's behavior problems remained significant after considering the moderated mediation effect. This suggests other mechanisms beyond mothers' psychological distress and their sensitivity may underlie this link. Future studies could examine the potential mediating role of mothers' physiological dysregulation that may result from ACEs and be transmitted to the child even during pregnancy, leading, in turn, to increased child behavior problems (Bos, 2017; Thomas-Argyriou et al., 2021). Another potential avenue of future research involves negative and incoherent mental representations of the parent-child relationship that may result from mothers' adverse experiences with their parents (Crowell et al., 2010). Such representations may lead to negative expectations of the child and color mothers' interpretation of the child's behavior, possibly contributing to a negative cycle that is perpetuated by the child's behavior (Groh et al., 2017).

ACEs and home environments

The third aspect of mother-child relationships we examined tapped a broader aspect of observed parenting: the home environment. We hypothesized that mothers' ACEs would hamper their ability to provide their children with a daily routine and verbal, physical, and social stimuli that are varied, organized, and developmentally appropriate (Bradley, 2015), and this link would

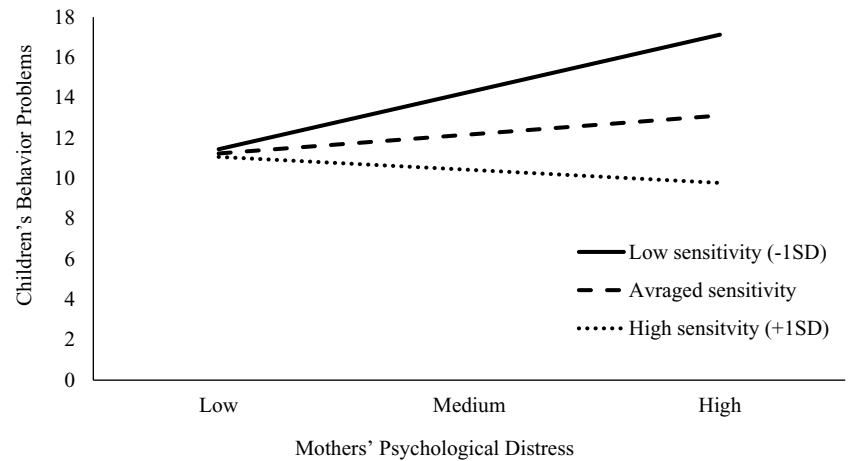


Figure 3. Associations between mothers' psychological distress and their reports of behavior problems in their children by maternal sensitivity ($N=80$). The solid line represents a significant simple slope ($p < .05$). Dashed lines represent nonsignificant simple slopes ($p > .05$).

be mediated by mothers' psychological distress. We also hypothesized that a better home environment would buffer against the effects of mothers' ACEs on their children's behavior problems. We found little support for these hypotheses. Correlation analyses indicated that mothers with increased ACEs provided a poorer home environment. Yet this link became nonsignificant when controlling for family background variables. In addition, mothers' psychological distress was not associated with the home environment, and the home environment did not moderate the indirect link between mothers' ACEs and their children's higher levels of behavior problems.

We are aware of only one study that examined one aspect of ACEs, mothers' experience of childhood maltreatment, in relation to the home environment, and it also failed to find significant associations (Ammerman et al., 2012). In light of the known effect of the home environment on children's secure attachment, cognitive performance, and socioemotional development (for a review, see Bradley, 2015), and as our study found initial evidence of a bivariate association with mothers' ACEs, we suggest more research should be conducted on this link with a larger sample. A larger sample may have increased power to capture more nuanced links that our study could not assess, such as the effects of specific aspects of ACEs (e.g., family dysfunction) on the different aspects of the home environment (e.g., organization and stimuli).

Strengths, limitations, and future directions

This study was unique in its sample, as it included two understudied ethnocultural groups: ultra-Orthodox Jews and Arab Muslims. Notably, there were no significant ethnocultural differences in ACE levels, maternal sensitivity, home environment, and children's behavior problems. Furthermore, the association of mothers' ACEs with lower maternal sensitivity and with increased child behavior problems, as well as the moderating mediating effect of mothers' psychological distress in the link between mothers' ACEs and more behavior problems of the child, remained significant when controlling for ethnocultural background. This strengthens the notion that ACEs may have universally harmful effects. Nevertheless, our lack of significant findings should be interpreted with caution. It could reflect lack of power due to the small size of our ethnocultural subsamples. Importantly, the subsamples were not large enough to examine the moderating role of ethnocultural background. This should be considered in future studies.

The lack of ethnocultural differences in ACE levels may suggest a similar prevalence of ACEs across ethnocultural groups. It may also suggest a similar level of mothers' openness in reporting them. As noted earlier, researchers have raised concerns about the tendency of ultra-Orthodox Jews and Arab Muslims to conceal or ignore abuse, neglect, and family dysfunction (Nadan et al., 2019). Recall that in our study, ACEs were collected by the families' therapists. For the most part, therapists did not reside in the same town/village/neighborhood as the mothers. Yet they shared a similar ethnocultural background. Coupled with the fact that ACEs were collected as part of the intake, after an initial rapport was likely established with the mothers, this practice may have helped to reduce barriers and facilitate mothers' reports on past adverse experiences. This may guide future practice with families from close-knit, traditional backgrounds.

Future studies may benefit from addressing the limitations of the study. These include a shared source correlation, namely mothers' self-reports of both their own ACEs and their children's behavior problems, as well as a focus on mothers without including fathers. In addition, mothers who participated in this study had a moderate level of at-risk parenting. Although the variability in our study's measures was relatively high, range restriction might have led to attenuated estimates of the associations between variables. Future studies should include more heterogeneous samples and a wider range of mothers, both mothers in the community who are considered at low risk in terms of their parenting and mothers who are considered at higher risk, such as mothers who are maltreating or neglecting their children or have a psychiatric disorder. Another limitation was the relatively small sample for which we conducted observations (due to resource limitations mentioned previously). This precluded our ability to explore the moderating role of ethnocultural background, nor could we study the effects of discrete types of ACEs of child maltreatment versus family dysfunction (Sayyah et al., 2022) or explore pairs of ACEs that are thought to synergistically increase the risk of poor mental health, such as sexual and physical abuse (Briggs et al., 2021). In a related context, researchers have called for extending the assessment of ACEs to other experiences, such as peer victimization (Sayyah et al., 2022), neighborhood violence, and residential instability (Usacheva et al., 2022). This line of research has yielded a three-dimensional model of childhood adversity of deprivation, threat, and unpredictability. Recent large-scale studies indicated that each of these dimensions uniquely affected different aspects of children's development (Ellis et al., 2022; Narayan et al., 2023; Usacheva

et al., 2022). This would be another important avenue for future research with larger samples. Finally, there is growing evidence that positive childhood experiences buffer or decrease the negative effects of ACEs on adults' wellbeing (Narayan et al., 2023). Future studies should consider whether they moderate the associations of ACEs with parenting and child behavior problems.

Implications

Our study offers several conclusions that can guide future research and practice. First, mothers were not referred to early intervention because of childhood trauma. Nevertheless, the study revealed a high level of multiple ACEs among these mothers and documented their toxic effects on the mother-infant/toddler relationship and toddlers' socioemotional functioning. Notably, the most frequent types of ACEs reported in this study were emotional abuse and neglect. Both are more difficult to detect than other ACEs. The study therefore emphasizes the importance of including ACE assessments in research on early parenting, as well as in routine screening and as part of the intake process in clinical interventions, even when ACEs are not the reason for referral. It is also vital to increase the awareness of professionals who meet regularly with parents of infants and toddlers (e.g., geneticologists, pediatricians, nurses at family health centers, educators who work with young adults or with infants and toddlers) and teach them how to ask about ACEs and how to respond when parents report being exposed to ACEs. Discussing ACEs with parents may be anxiety-provoking for researchers and professionals (Becker-Blease & Freyd, 2006), but research suggests that asking about ACEs is likely to arouse relatively little distress in clients and is perceived by them as highly important (Cromer et al., 2006). Finally, asking about ACEs must go hand in hand with providing parents with professional support or referring them to clinical interventions to prevent the harmful effects of ACEs on parenting and the socioemotional development of children.

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Competing interests. None.

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