The Role of Socioeconomic Adversity and Armed Conflict in Executive Function, Theory of Mind and Empathy in Children

Buket Kara[1*]

Bilge Selcuk[2]

[1]Centre of Resilience for Social Justice, School of Sport and Health Sciences, University of Brighton, Brighton, United Kingdom

[2]Department of Psychology, Koç University, Istanbul, Turkey

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*Corresponding author: Buket Kara; Centre of Resilience for Social Justice, School of Sport and Health Sciences, University of Brighton, Brighton, BN1 9PH, United Kingdom; email: b.kara@brighton.ac.uk

Abstract

This study investigates the role of socioeconomic adversity and armed conflict in executive function (EF), theory of mind (ToM) and empathy in a rarely studied group, children living in eastern Turkey. The data were collected from 115 children (60 girls) aged 39 to 95 months (M = 68.22, SD = 14.62). Results revealed that children's performance was low in the EF and ToM tasks, and high in the empathy task. In path analysis, controlling for age, armed conflict experience predicted lower EF (β = -.15) and higher empathy (β = .21), and socioeconomic adversity predicted lower ToM (β = .20). These findings contribute to our knowledge on cognitive and emotional development of children who live in such disadvantaged contexts.

Keywords: executive function, theory of mind, empathy, armed conflict, socioeconomic adversity

The Role of Socioeconomic Adversity and Armed Conflict in Executive Function, Theory of Mind and Empathy in Children

Early childhood is a profound period for cognitive, social and emotional development. Environmental risk factors, however, may prevent children from reaching their developmental potential and lead to sub-optimal development and disruptions in cognitive domain [1], as well as social and emotional competence and self-regulation [2], that may have effects over the life course. Hence, WHO [3] identifies early childhood development, from birth to 8 years of age, as a priority area of work to prevent the burden of child sub-optimal development and to improve health, wellbeing, and equity.

Sub-optimal development in childhood is associated with a range of environmental factors including poverty [4] and exposure to violence (e.g., community violence) [5]; and is observable in many parts of the world today, even in high-income countries such as the United States, Australia, and United Kingdom [6], as well as developing countries [1]. In some countries, however, risk factors often co-occur, and their cumulative effect compromises children's development to a greater extent [5]. Turkey is one of these countries where multiple risk factors such as socioeconomic adversity and armed conflict might interfere with cognitive, social and emotional functioning of children living in certain regions. In this study, we aimed to investigate children's executive function, theory of mind and empathy in relation to these risk factors.

Executive Function

Executive function (EF) refers to as a set of cognitive processes involved in conscious control of thought and action in goal-directed behavior [2, 7]. It emerges in infancy and develops rapidly in early childhood from the interplay of biological and social factors [8]. Early EF is an important predictor of educational achievement [9], socioemotional competence [10], as well as other cognitive skills such as theory of mind [11]. EF is also

conceptualized as the cognitive component of self-regulation [12], leading to social and behavioral competence by organizing complex information, shifting attention flexibly, and inhibiting undesired or impulsive responses to adjust behavior with respect to their goals and environmental demands [2]. Consistently, meta-analytic studies found that EF is robustly associated with problem behaviors in children such as depression [13] and aggressive behavior [14].

Theory of Mind

Another major cognitive skill that is critical for healthy social and psychological functioning is theory of mind (ToM). ToM refers to the ability to understand and infer mental states (e.g., beliefs, desires, thoughts and intentions) of other people, and that these mental states might differ from one's own [15]. A significant advancement in ToM occurs between 3 and 5 years of age [16, 17], and it continues to advance into late childhood and beyond [18]. Differentiating one's own and other people's mental states allows children to interpret situations from different perspectives, and to predict and explain behaviors of others, which in turn help them shape their behaviors accordingly. Consistently, ToM is found to be associated with social competence [19, 20] and prosocial behavior [21], as well as EF [22].

Empathy

Empathy is an affective response that stems from comprehension of emotional state or condition of others, which is in a similar direction that the other person is feeling or would be expected to feel in the given situation [23]; it is a fundamental aspect of social and emotional development. Findings suggest that empathy begins to develop in the first years of life, in the form of reflexive crying in newborns and personal distress in infancy and toddlerhood [24], and shows significant improvement during early childhood [23, 25] along with advancement in cognitive and language skills. Empathy has both emotional and cognitive components, such as self-other differentiation and accessing information relevant to another's emotional

state [23], helping children shape their behavior toward others, and facilitate and maintain more meaningful social interactions [25]. Not surprisingly, empathy has been linked to positive aspects of social development such as prosocial behavior [26], social competence [27], and moral development [28].

Executive Function, Theory of Mind and Empathy in the Context of Socioeconomic Adversity and Armed Conflict

Adverse experiences in early childhood may cause immediate and long-term disruptions in cognitive, social and emotional development. One such adversity is living in socioeconomically disadvantaged contexts characterized by low socioeconomic status (SES), poverty, and unemployment [29, 30]. Malnutrition is one of the pathways that poverty may cause disruptions in brain development, and so in cognitive functioning [31]. Low SES is also related to low parental investment in cognitive development of children, including less intellectually stimulating facilities (e.g., books, educational toys), day-care or preschool education, and also nonmonetary goods such as time spent with children [32, 33], as well as high levels of distress in parents that increase the likelihood of negative parenting practices and child maltreatment [34-36]. Hence, studies investigating socioeconomic adversity and its associates show that low SES is linked to poor EF development, and also higher social and emotional difficulties in children [4, 36-39]. Similarly for ToM, reviewing 76 studies, a meta-analysis study [40] showed modest but significant association between SES and mental state understanding both concurrently and longitudinally. Research that investigates empathy in relation to SES is scarce and less conclusive. For example, Malti et al. [41] found that SES was positively linked with empathy in 6-year-olds, when empathy was measured as a composite of child, parent and teacher reports. However, in Nefdt's [42] study, parent-reported empathy was negatively correlated with SES in 7-to-10-year-olds, whereas individual task-based assessment of empathy was not associated with SES. Similarly,

Ekerim-Akbulut et al. [43] reported that SES was not related to individual task-based assessment of empathy in preschool children.

Another adversity that poses a risk to early cognitive, social and emotional development is political violence. In different regions of the world, children are exposed to a range of violent acts including isolated events such as terrorist attacks or a broader context of political violence such as an armed conflict. Responses to political trauma include behavioral and emotional sumptoms, sleep problems, disturbed play, and psychosomatic symptoms [44]. Studies showed that exposure to terrorist attacks may lead to attention and memory problems in children [45]. At the broader level, contexts where armed conflict occurs are highly stressful; and they usually possess additional adversities such as malnutrition, poverty, unemployment, unsafe or inadequate housing, and lack of access to health services and education [46]. In such environments, parents' psychological trauma and distress, combined with safety concerns and economic challenges, may lead to disruptions in family functioning and child maltreatment. Hence, armed conflict often set the stage for exposure to repeated and toxic stressors, which in turn, may cause structural and functional changes in the brain and cognitive functions [2, 47]. Traumatic experiences, on the other hand, may lead to post-traumatic stress disorder that plays a role in cognitive difficulties [48]. Hence, not surprisingly, armed conflict experience is associated with disrupted cognitive functioning in children. In Gaza Community Mental Health Programme, for instance, Qouta et al. [49] reported that severely traumatized 10-11-year-old children had more difficulty in information processing such as attention, recall and concentration compared to less traumatized peers, while they showed no difference in more stable structural characteristics such as IQ and creativity.

The literature is scarce in terms of research on the relations between empathy and political violence. Community violence, however, is a relevant and well-researched context

that offers insights on the relation between empathy and violent experiences in adolescents. One line of this literature focuses on *desensitization*, the process of attenuation or elimination of cognitive, emotional and behavioral responses to a stimulus [50]. In the context of violence, desensitization may lead to numbing or blunting of emotional response and to poor emotion regulation and processing of cues that would normally trigger empathic responding [28; 51]. Desensitization and consequent low empathic responding have been proposed as the key mechanism that explains the link between exposure to violence and violent behavior. Such mechanism, however, was not observed in case of community violence. Studies found that the number of community violence incidents exposed by adolescents was not related to empathy [52] or low emotional distress (as a marker of desensitization) [53].

Another line of empathy research shows that children, from very early years, are sensitive to others' pain and distress [23]. Furthermore, compared to other emotions (e.g., happiness, anxiety), observation of pain may be distinct in its capacity to trigger affective sharing and empathic response because empathy for pain activates similar regions in the brain (e.g., anterior insula cortices and anterior cingulate) as directly experiencing the pain [54]. Hence, an armed conflict, as creating an environment that is conducive for observing feelings of pain and distress in others, may trigger affective sharing and empathic response in children.

The Context in Eastern Turkey

Turkey is a developing country where psychological development and wellbeing of children in certain regions might be compromised because of contextual risk factors. One of them is socioeconomic adversity. Using Eurostat and Turkstat data, Bahçeşehir University Center for Economic and Social Research [55] reported that, among 28 European countries, Turkey had the highest rate (36.2%) of children living under severe material deprivation in 2014, which was three times higher than the European average. Compared to other regions in

Turkey, the child poverty rate was highest in the east reaching up to 55% [55], where Kurds, the largest non-Turkish ethnic group, constitute the majority. According to the Turkey Demographic and Health Survey published by Hacettepe University Institute of Population Studies [56], people living in eastern Turkey are challenged with lowest rates of urbanization, household wealth, and literacy, and highest rates of fertility and early childhood mortality in Turkey. Consistently, Turkstat [57] reported the lowest annual income rates in the eastern cities in 2017.

Besides socioeconomic challenges, from time to time, eastern Turkey has also been under the influence of a low-intensity armed conflict between the Turkish state and the Kurdish armed forces, which resulted in periods of combat, particularly in the rural areas. Between mid-1980s and early 2000s, the conflict culminated in more than 35 thousand deaths [58] and displacement of more than 1 million civilians [59]. Following a period of ceasefires in the early 2000s, the negotiation attempts failed in July 2015, and the armed conflict reignited both in rural and urban areas. In the following one-year period, fierce battles took place; and emergency state and open-ended curfews were announced in nine cities, affecting 1.67 million residents living in the area [60]. During the curfews, people, including children, were confined in their houses for a period ranging from a day to consecutive months in stressful conditions, sometimes without access to education and life-sustaining materials such as food, water, or medicine. Reports from both governmental authorities and non-governmental organizations revealed that civilians, including children, were sometimes caught in the crossfire. Accordingly, 323 civilians (79 children) died [60], and 2,040 civilians were wounded [61].

The extant literature suggests that such a longstanding socioeconomic hardship, armed conflict, and associated stress may lead to negative psychological outcomes in children. In support, in our earlier study [62] conducted immediately after the 2015-2016

conflict in three conflict-affected cities of Turkey, parents of 506 children (ages ranging from 5.5 to 18 years) reported extremely poor socioeconomic conditions as well as exposure to various forms of armed conflict events and family violence, which were in turn found to be associated with high levels of emotional and behavioral problems in children.

The Current Research

As summarized in this paper, the literature shows that socioeconomic adversity is a major risk factor for the development of cognitive skills including EF and ToM [2, 40]; however, research is more limited and less conclusive for the association between SES and empathy [41, 42]. Furthermore, exposure to political violence is also associated with poor cognitive functioning (e.g., attention and memory problems) and wellbeing in children [45, 49]. However, the links between armed conflict exposure and EF, ToM and empathy in children, to our knowledge, have not been studied yet. These are important skills for normative development and play a role in healthy psychological functioning. Therefore, investigation of contextual factors relevant to EF, ToM and empathy has important implications for future research, as well as future intervention and policy work. The current study seeks to address this gap by providing a more nuanced understanding of the role of socioeconomic adversity and armed conflict in children's EF, ToM and empathy.

In eastern Turkey, socioeconomic adversity and low-intensity armed conflict pose a significant risk to psychological wellbeing in 6-to-18-year-old children [62]. Yet, in this context, cognitive and emotional skills in early childhood in relation to potential risk factors have never been studied. In the present study, we investigated EF, ToM and empathy in children living in eastern Turkey with respect to their exposure to adverse low SES and armed conflict, that are experiences posing a risk for normative development. In this research, we focused on children aged between 3 and 8 years in line with the WHO guidelines [3] highlighting the importance of development until the age of 8, and developmental science

literature showing significant advances in cognitive and emotional skills after age of 3. Drawing upon the previous literature, we predicted that low SES would be associated with lower EF and ToM skills. Further, based on the literature on the relation of political violence and cognitive skills such as memory and attention, we predicted that armed conflict experiences would be linked to lower EF skills. Given that EF is closely related to ToM, we further speculated that political violence might be related to disruption in this domain too. Regarding empathy, we grounded our expectations on the literature highlighting the emotion contagion and children's sensitivity towards others' pain and distress. Considering that low SES and armed conflict experiences would expose children to an environment that others feel distress, pain, or both, we predicted that higher levels of exposure to low SES and armed conflict would be associated with higher levels of empathy in children. Finally, we tested whether low SES amplified the strength of the association between armed conflict and child outcomes.

Method

Participants

Data were collected in two eastern cities of Turkey, where we reached 93 households. Participant selection criteria were 1) to have a child between the ages of 3 and 8 in the household, and 2) the child not having a clinically diagnosed developmental disorder (e.g., mental retardation, autistic spectrum disorder). Seventy-one mothers provided information about one child, and 22 mothers gave information about their two children by completing questionnaires separately for each child. Overall, the data included information about 115 children (M_{age} = 68.22 months, *SD* = 14.62, range = 39-95 months): Sixty girls (M_{age} = 67.02 months, *SD* = 14.66) and 55 boys (M_{age} = 69.53 months, *SD* = 14.59), with similar ages ($F(1,113) = 0.85$, $p = .36$). Among children, 10.4% were aged 3 years (39 to 47 months), 16.5% aged 4 years (48 to 58 months), 27.8% aged 5 years (60 to 69 months), 27% aged 6

years (72 to 82 months), and 18.3% aged 7 years (84 to 95 months). According to mother reports, none of them had a known developmental disorder, and two children had a chronic health problem (i.e., atrial septal defect and hypothyroidism) and were on prescribed medication. Overall, the mothers evaluated their children's physical health (from 1 = *bad* to 5 = *perfect*) in the past six months as *fine* (M = 2.83, SD = 0.60).

Regarding the family composition, 96.5% of children came from intact families, one child (0.9%) had separated or divorced parents, and three children (2.6%) had lost their fathers. Households were generally crowded, ranging from 3 to 15 with an average of 6 people (M = 6.25, SD = 2.33). Twenty-four families (25.8%) were living with extended family members. The number of siblings ranged from 0 to 11 (M = 3.11, SD = 2.42), while 27% of children had two siblings and 20% had three siblings. In 57% of families, Kurdish was reported as the primary language spoken in the household, while Turkish was also spoken. In 25.8% of families, Turkish was the primary language, but Kurdish was also spoken. In 10.8% of families, Kurdish was reported as the only spoken language between the family members, and in 6.5%, Turkish was the only spoken language.

The families were coming from socioeconomically disadvantaged backgrounds. The education level of parents was low. Among mothers, 28.3% were illiterate, 20.7% were literate but did not complete primary school, 33.7% completed primary school, 9.8% completed secondary school, 5.4% finished high school, and only two mothers (2.2%) had a college education. Likewise, 10.8% of fathers were illiterate, 9.7% were literate but did not complete primary school, 38.7% completed primary school, 14% completed secondary school, 19.4% finished high school, and only seven fathers (7.6%) had a university degree. In regard to the occupation status, 96.8% of mothers did not have a paid work; only two mothers (2.2%) reported having a full-time job, and one mother (1.1%) had a part-time job. Among fathers, 31.5% were unemployed; 47.3% had a full-time job, and 21.5% had a part-time or

seasonal job. Among the jobholder parents, 71.2% had low-status occupations (e.g., janitor, driver), 21.2% were tradesmen, and 7.6% were working in established professions (e.g., preschool teacher, public officer). Mothers also reported low levels of monthly household income: In 65.6% of families, the monthly income was below the minimum wage (1,300 TRY; ~350 USD), 32.3% had a monthly income ranging from 1,300 to 2,800 TRY (~350 to 755 USD), and two families (2.2%) had a monthly income ranging from 2,801 to 4,800 TRY (~755 to 1,290 USD). According to the Income and Living Conditions Survey of Turkstat [63], the poverty line calculated for a family of four was 5,693 TRY (~1,885 USD) in 2016. Incomes lower than this indicated poverty. Furthermore, incomes 50% lower than the poverty line (i.e., 2,847 TRY; ~942 USD) is considered as extreme poverty [37]. Based on these definitions of poverty and extreme poverty, we can say that the vast majority (97.8%) of families in our sample were living in extreme poverty, while the rest (2.2%) were living in poverty.

The education level of parents and household income were significantly correlated (*r*'s = .39 to .54, $p < .001$); so they were standardized and averaged to compute the variable of socioeconomic status (SES) of family.

Procedure

After obtaining the approval of the University Institutional Review Board (IRB), data were collected at one time-point in Fall 2017. Starting in nine neighborhoods in two cities, we reached the participants via random house visits and exponential non-discriminative snowball sampling. Except for three households, where children were shy and declined participation, all participants we approached volunteered for participation. Data were collected by the first author, as well as research assistants who were native Kurdish-Turkish bilingual speakers and had previous experience in social or field studies. Before the field study, the assistants were given training for data collection by the first author.

Mothers were explicitly informed that they had the right to stop the interview at any time, avoid answering any question and to subsequently withdraw any data that they gave. After their oral consent was obtained, mothers were administered questionnaires to assess background information and children's armed conflict experiences. In cases where a mother provided information for two children, the forms and scales were administered separately for each child, and the mothers were instructed to respond keeping that particular child's (the target child) experiences in mind. Children were asked for their assent, and then, administered the tasks, if possible, in a separate room or else in a quiet environment. The tasks were presented on ASUS TP200 touchscreen computers via E-Prime software. First, a short practice game was introduced to train children in using the touchscreen for responding, and then the tasks were presented in a set order: EF, ToM, and empathy (lasting about 30-40 min). In compensation for their participation, the mothers were provided 20 TRY (~5.5 USD) worth of shopping cards for each child they provided information, and each child was given small gifts (e.g., candies, stickers) regardless of their performance.

All of the tasks utilized in the current study had previously been translated into Turkish and used in research conducted with Turkish preschool children, and they have been found to be reliable and valid measures for Turkish samples [17, 43, 64]. In the current study, all forms, scales, and tasks were translated from Turkish into Kurdish by a professional bilingual translator and then reviewed by three bilingual psychologists. Depending on the language preference of participants, Turkish or Kurdish version of the materials were administered. Seven mothers and two children preferred to complete the measures in Kurdish, while the rest completed the measures in Turkish and asked once or twice for clarification in Kurdish.

Measures

Background information form. Mothers completed a background information form

where they provided information about the child (e.g., age, gender, number of siblings), parents (e.g., education, occupation, employment status, marital status), and household characteristics (e.g., monthly household income, social security conditions, household size, language). The education level of parents was measured on an 8-point Likert-type scale ranging from 1 = *illiterate* to 8 = *has a graduate degree*. Monthly household income was measured on an 8-point scale ranging from 1 = *below 1,300 TRY* (the minimum wage in Turkey at the time of data collection; ~350 USD) to 8 = *above 18,001 TRY* (~4,850 USD).

Executive function. EF in children was measured by using two tasks from the NIH Toolbox Cognition Battery [65]: Flanker and Dimensional Change Card Sorting (DCCS). The tasks were validated for children aged between 3 and 8, with excellent test-retest reliability [65]. During the tasks, children were required to hold the rules in mind, inhibit dominant natural response when irrelevant, and shift attention to relevant stimuli. Thus, these tasks tapped three components of executive functioning; working memory, inhibitory control, cognitive flexibility.

Flanker task. In the computerized Flanker task, children were presented five stimuli (either fish or arrows) in a line [65]. In congruent trials, all stimuli pointed to the same direction; while in incongruent trials, the middle stimulus pointed the opposite direction. Children were instructed to press the button that matched the direction the middle stimulus was pointing.

Children were first presented practice trials, where they received verbal instructions and feedback related to their performance. In order to proceed to the main block, children had to pass the practice trials (i.e., at least three correct responses in four trials). Failure in practice trials four times led to the termination of the task, where children received a score of 0 for their performance. Children who passed the practice trials received the fish block including 13 congruent and 7 incongruent trials presented in a pseudorandom order, where 1

to 3 congruent trials preceded an incongruent trial. Children who correctly responded to five or more incongruent trials, then, proceeded to an additional block of 20 trials (13 congruent, 7 incongruent), where they were presented arrows as stimuli instead of fish.

Based on the NIH toolbox scoring guide [65], for each child, an accuracy score was calculated on a scale from 0 to 5 (i.e., 0.125 x number of correct responses). For children who responded with 80% or higher accuracy, a reaction time (RT) score was also calculated. For this, first, the outlier trials in RT (i.e., shorter than 100ms or longer than 3 *SD*s from child's mean) were eliminated. Then, median RT's for correct responses to incongruent trials were log (Base 10) transformed and algebraically rescaled to a 0-5 scale in reverse order, where smaller RT values were at the upper end of the 0-5 range. The rescaled RT scores (0 to 5) were added to the accuracy scores (0 to 5) to calculate a final Flanker score ranging from 0 to 10.

Dimensional change card sorting task. In the computerized DCCS, children were presented cards that had colored shapes (e.g., a ball or a truck in yellow or blue) on them. In each trial, children were instructed with a dimension (i.e., shape or color) that they should sort the cards. Throughout the task, children sorted by one dimension first and then for the other dimension, receiving a mixed block of trials that switched back and forth between sorting directions. The task consisted of a practice block (four trials), a pre-switch block (five trials for the first dimension), a post-switch block (five trials for the second dimension), and a mixed block (23 trials for dominant dimension; 7 trials for non-dominant dimension). Dimension order and dominance were counterbalanced across participants.

As in the Flanker task, during the practice trials, children were presented instructions and feedback on their performance. For children who failed to pass the practice trials up to three times, the task was terminated, and children received a score of 0. For children who passed the practice trials, outlier trials were eliminated. Children, then, were given an

accuracy score (i.e., 0.125 x number of correct responses), and children who responded accurately in at least 80% of the trials received both accuracy and RT scores to be summed up as their final DCCS scores, which ranged from 0 to 10.

The correlation between children's Flanker and DCCS scores was high, $r(113) = .52$, $p < .001$. Hence, a total EF score was calculated for further analysis by taking the average of the Flanker and DCCS task scores [64].

Theory of Mind. Theory of Mind was measured by five tasks, where two or three characters interact in five different stories and children are asked questions regarding their knowledge of the actors' beliefs, desires, and thoughts. The first three tasks measured children's first-order ToM ability, whereas the remaining two tapped onto the second-order ToM ability.

In the first task, Unexpected Change of Location [66], children were shown that the location (basket) of the protagonist's object (ball) was changed by another character in protagonist's absence and put into a different location (box). Children were first asked two memory control questions to make sure that they understood the story and remembered the details: "Where was the ball at the beginning?" and "Where is the ball right now?". As the test questions, children were asked where the protagonist thought the object was, and where would she look for the object when she returns to the room.

In the second task, a modified version of Unexpected Contents [67], children were shown an egg carton and asked: "What is inside the carton?". After their answer, the egg carton was opened, and the children were shown that there were candies inside the carton. The carton was closed then, and children were presented a child and asked: "This is Ahmet (a Turkish name). Ahmet has never seen inside the carton. What will Ahmet think to find in the carton: Eggs or candies?". The test question was followed by two control memory questions: "What is inside the carton really: Eggs or candies?" and "Did Ahmet see inside the carton?".

In the third task, Misleading Picture [68], children were first presented different types of animal ears and were asked to identify what these ears were part of. Following their answers, they were shown the entire animals. Then, they were presented two petals of a sunflower that looked like the ears of a cat, and asked to guess what they thought the entire picture was by looking at these petals only. Following their answers, children were shown that the entire picture belonged to a sunflower. Children, then, answered a memory control question, "What did you think this picture showed when you first saw it?", and the test question, "What would your friend, who never see the entire picture, think the picture is?".

The fourth and fifth tasks were used to measure the second-order ToM ability. In the Ice Cream Man task [66], children were presented the story of two children (Turkish names: Merve and Can). Merve and Can were at the park, and Merve wanted to buy ice cream, but she did not have any money. Therefore, Merve decided to go home to get money and return to the park to buy ice cream. After Merve left, the ice cream man told Can that he changed his mind and decided to go to the school garden to sell ice cream. On his way to the school, he saw Merve, who was walking towards her home, and told Merve that he was going to the school garden to sell ice cream. Can went to Merve's house but could not find her there. Merve's mother told him that Merve had gone to buy ice cream. After this story, children were first asked memory control questions: "Where is the ice cream man now?", "Does Can know that Merve spoke to the ice cream man?". Then, children answered the test question, "Where does Can think that Merve will go to buy an ice cream?", and a final memory control question, "Where did Merve go to buy the ice cream?".

The final task, Chocolate Bar Story [69], presented the story of two siblings (Turkish names: Barış and Elif), where one of them (Barış) received a chocolate bar, but not the other one (Elif), because she was naughty. After eating a piece of his chocolate, Barış put it to a drawer and left the room. Elif, annoyed, took the chocolate bar from the drawer and hid it in

the toy chest. Meanwhile, Barış was taking out the garbage, and from the window, he saw that Elif took the chocolate bar from the drawer and hid it in the toy chest. After this story, children were first asked memory control questions: "Where is the chocolate now?", "Does Barış know that Elif hid the chocolate bar in the toy chest?", "Does Elif know that Barış saw her when she hid the chocolate bar?". Then, the story continued as Barış came back to the room and said that he wanted to eat chocolate. Children were, then, presented the test question, "Where does Elif think that Barış will search for the chocolate bar?", and a final memory control question, "Why does Elif think that?".

Children who passed memory and control questions received a score of 1 for each correct response to the test questions. A final ToM score was calculated by adding up these scores, which ranged from 0 to 6.

Empathy. A computerized task [43, 64] was used to measure child's level of empathy towards people experiencing everyday events that might have the potential to inflict pain (e.g., pinching a finger in a door). The task included 18 pictures, where children were instructed to look at the situation carefully and respond to two questions, "How much pain you think the person in the picture is experiencing?" (i.e., assessing affective sharing) and "How sorry you feel for this person" (i.e., assessing empathic concern), using a visual analog scale ranging from 0 = *very little or none* and 100 = *very much*. The order of the questions was counterbalanced.

The correlation between affective sharing and empathic concern responses was high, $r(106) = .83$, $p < .001$. Hence, a total empathy score was calculated by taking the average of responses given for these two questions [64].

Armed conflict experience. To assess the type and frequency of armed conflict events that children experienced, a questionnaire was administered to mothers [62]. The questionnaire included two sections assessing children's exposure to conflict-related events

and other experiences such as residence or school change, and separation. The first section included a selection of 14 events from the Childhood War Trauma Questionnaire [70], developed to measure the type and frequency of war experiences that Lebanese children were exposed to during the civil war, and three additional conflict-related events that could be common in the armed conflict zone in Turkey (i.e., exposure to tear gas, being forced to participate in the protests, and being intercepted by the armed forces while walking). Considering that a traumatic event might have been experienced in different levels (e.g., personal experience with a traumatic event, witnessing it, or learning about it; see the Life Events Checklist) [71], we assessed children's experiences for each event on two exposure levels, as direct or indirect. Overall, the mothers reported for a total of 17 conflict-related events as to whether the target child was exposed to the event or not; and if exposed, whether the experience was direct (i.e., personal experience) or indirect (i.e., witnessing the event, or hearing that it happened to a close associate). Mothers rated the frequency of the exposure to the event on a 3-point Likert-type scale ranging from 1 = *once* to 3 = *very often*. From this section, we created a variable to indicate the exposure severity as 0 = *no exposure*, 1 = *indirect exposure*, 2 = *direct exposure*. Next, we created two 4-point scale variables for the frequency of indirect exposure and direct exposure, ranging from 0 = *not applicable* (for those with no exposure) to 3 = *very often.* For each conflict-related event, we calculated an 'indirect exposure' and 'direct exposure' score as multiplying the frequency score by the exposure severity. Scores for indirect and direct exposure were then summed to obtain an overall exposure score for that particular event. For instance, a child who witnessed a conflict-related event a few times [2 (i.e., *a few times*) x 1 (i.e., *indirect exposure*) = 2] but did not personally experience the same event [0 (i.e., *not applicable*) x 2 (i.e., *direct exposure*) = 0] received a score of 2 for that event. The scores from conflict-related events were used in the calculation of an overall 'armed conflict experience' score.

In the second section, mothers provided information about their children's stressful experiences resulted from the armed conflict such as residence or school change, separation from parents or other close associates (e.g., siblings, friends, or relatives). If the child experienced the event, caregivers were asked to provide additional information regarding its reason (e.g., "Why did the child change residence?") and frequency (e.g., "How many times did the child change residence?"). To be used in the calculation of the overall 'armed conflict experience' score, children were given scores with respect to their experiences of residence and school change (0 = *no change*, 1 = *once*, and 2 = *twice or more*), and separation from parents and other close associates (0 = *no separation*, and 1 = *separated*).

The overall 'armed conflict experience' score was calculated by summing the scores that children received from these two sections of the questionnaire, where higher scores indicated higher levels of armed conflict experience (Cronbach's α = .81).

Data Analysis Plan

The analyses proceeded in three stages. First, we examined the associations between the child outcomes (i.e., EF, ToM, empathy) and possible risk factors (i.e., SES, children's armed conflict experiences). For this, we first computed Pearson product-moment correlation coefficients between the study variables. Because the given child outcomes develop rapidly in early childhood [8, 16, 23], we computed partial correlations between study variables controlling for child's age.

Then, to address our research questions, we examined the relations between the risk factors (i.e., SES, children's armed conflict experiences) and child outcomes (i.e., EF, ToM, empathy) simultaneously. Multivariate multiple regressions between the study variables were examined via path analysis. As in the correlation analysis, the association between child's age and child outcomes were controlled by including direct paths from age to EF, ToM and empathy in the model. Later, the interaction term of SES and armed conflict experience was

included in the model to explore whether SES moderated the relations between armed conflict and child outcomes. The path analysis was performed with AMOS v24 using maximum likelihood. We evaluated fitting of the model regarding the following criteria: Model chi-square to be nonsignificant, The Root Mean Square Error of Approximation (RMSEA) to be lower than .06 with 90% confidence intervals (CIs) within 0 to .10, the Comparative Fit Index (CFI) to be at or higher than .90, and values of the Expected Cross-Validation Index (ECVI) to be less than its value in the saturated model.

Results

The descriptive statistics (see Table 1) showed that, in general, children in our sample had low levels of EF and ToM and a high level of empathy.

Table 1

Descriptive Statistics for Study Variables (N = 115)

Variable	*M*	*SD*	*Min*	*Max*
Demographic variables				
Age (in months)	68.22	14.62	39	95
Maternal education (1-8)	2.46	1.33	1	8
Paternal education (1-8)	3.46	1.52	1	7
Income (1-8)	1.35	0.51	1	3
Number of siblings	3.11	2.42	0	11
Household size	6.45	2.43	3	15
EF (0-10)	2.93	2.10	0	8.40
ToM (0-6)	1.37	1.42	0	6
Empathy (0-100)	73.78	13.52	43.25	95.78
Armed conflict experience (0-159)	29.15	14.49	6	68

Zero-order correlations (see Table 2) showed that EF, ToM and empathy increased significantly with age. When age was controlled: EF was negatively correlated with armed

conflict experience, and positively correlated with SES. ToM was positively correlated with SES, but not with the level of armed conflict experienced by the child. The correlation of empathy with armed conflict experience was significant and positive, but its association with SES was nonsignificant.

Table 2

Zero-order and Partial Correlations Between Study Variables Controlling for Age (N = 115)

Variable	Age	1	2	3	4	5
1. EF	.58***	-	.15	.10	.21*	-.24*
2. ToM	.50***	.39***	-	.07	.22*	-.02
3. Empathy	.36***	.28**	.23*	-	.08	.19*
4. SES	.00	.17+	.19*	.07	-	-.30**
5. Armed conflict experience	.02	-.18+	-.01	.19+	-.30**	-

Note. Hyphens represent the diagonal. Below the diagonal, zero-order correlations are presented; above the diagonal, partial correlations controlling for child's age (in months) are presented. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Path Analysis

Using path analysis, we investigated the predictive role of the risk factors (i.e., SES, armed conflict experience) in child outcomes (i.e., EF, ToM, empathy). The model included direct paths from SES and armed conflict experience to EF, ToM and empathy, and covariance between SES and armed conflict experience.

The model showed a perfect fit to the data, $\chi^2(5, N = 115) = 3.78$, *ns*, *CFI* = 1.00, *RMSEA* = .00 (90% *CI* = .00 to .11), *ECVI* = .42 (90% *CI* = .43 to .49; saturated model's *ECVI* = .47), and explained 39% of the variance in EF (R^2 = .39), 28% of the variance in ToM (R^2 = .28), and 17% of the variance in empathy (R^2 = .17). Analysis of direct paths (see Figure 1) showed that SES significantly predicted ToM, but not EF and empathy.

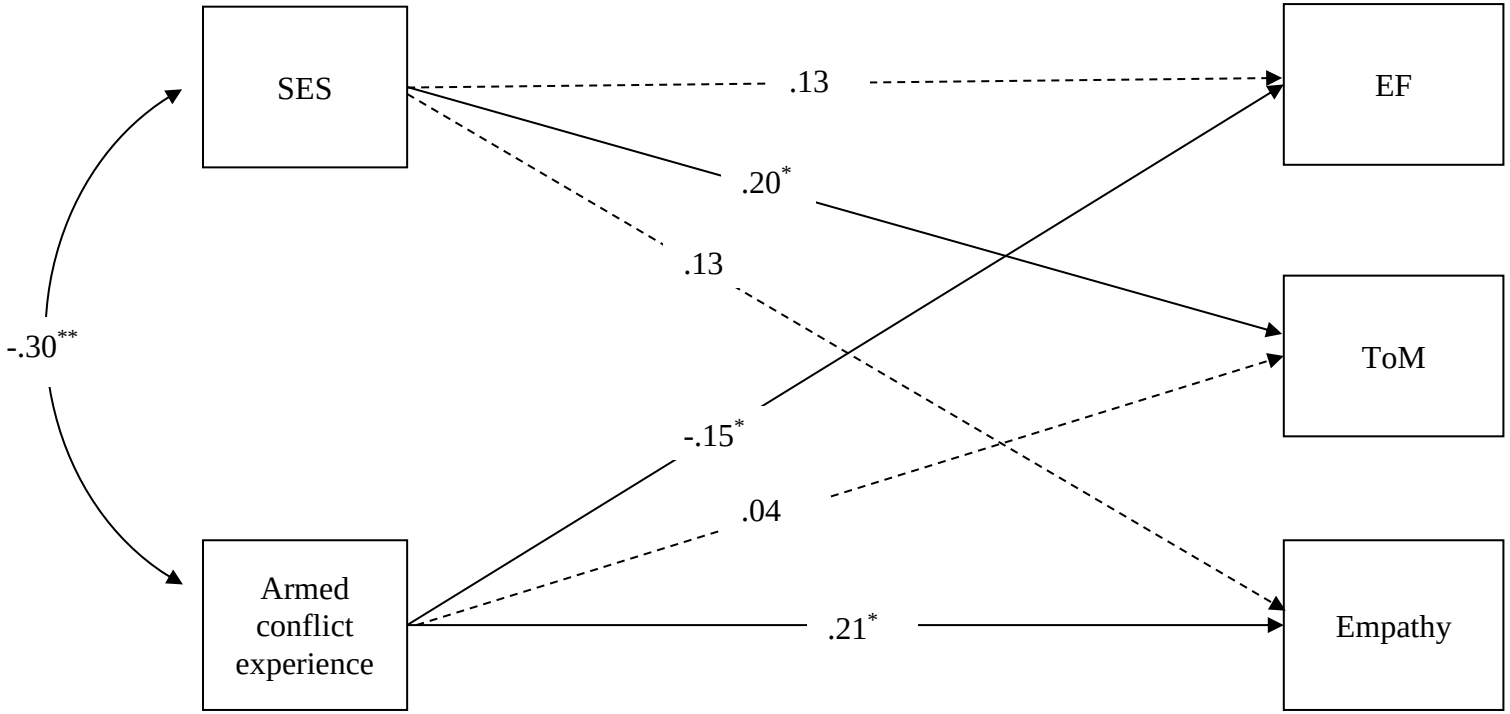

Figure 1. Standardized estimates of direct paths in the model (N = 115). The dotted lines represent nonsignificant paths.

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

The level of armed conflict experienced by children significantly predicted EF and empathy, but not ToM.

Next, we tested whether SES moderated the relations between armed conflict and child outcomes. For this, the interaction term of SES and armed conflict experience was included in the model with direct paths to child outcomes. The model showed a perfect fit to the data, $\chi^2(6, N = 115) = 4.88$, *ns*, *CFI* = 1.00, *RMSEA* = .00 (90% *CI* = .00 to .11), *ECVI* = .55 (90% *CI* = .56 to .63; saturated model's *ECVI* = .61). Beta values and significance of the paths from SES and armed conflict experience to child outcomes remained similar to the previous model, except the increment in the beta values of the path from armed conflict to EF (β = -.18) and the path from SES to ToM (β = .27). The interaction of SES and armed conflict did not predict EF (β = -.11), ToM (β = .14), and empathy (β = .03), indicating that SES did not alter the association between armed conflict experience and child outcomes.

Discussion

Literature clearly and consistently shows that EF, ToM and empathy skills play an important role in healthy development in various areas such as cognitive performance and academic outcomes, social and emotional competence, and adaptive social behaviors. However, adverse life experiences that occur in early childhood, the period these skills advance significantly, may interfere with normative development and result in poor outcomes. In this regard, the present study aimed to investigate EF, ToM and empathy skills in children living in eastern Turkey, where socioeconomic adversity and low-intensity armed conflict may pose a risk for optimal development in children. In line with the literature [4, 40], we expected that low SES would be linked to low EF and ToM skills. Furthermore, based on the literature showing the role of political violence in cognitive difficulties [45, 49], we expected that armed conflict experiences would be associated with lower EF and ToM skills. We also expected that, as low SES and armed conflict experiences would create an

environment that would trigger affective sharing and emotion contagion [23], low SES and armed conflict would be related to higher levels of empathy in children. We, then, explored whether low SES amplified the strength of the association between armed conflict and child outcomes. The results partially confirmed our predictions.

The results of our study showed that children's EF skills were significantly linked with both SES and armed conflict experience, which is in line with many studies and systematic reviews in the literature [2, 29, 45, 49]. Research highlights that poverty may cause disruptions in cognitive development, including EF [4, 29, 30, 37, 39]. Political violence (ranging from incidents of terrorist attacks to an armed conflict context) is also shown related to difficulties in cognitive performance such as attention, memory and concentration [45, 49], which are important for or components of EF [2, 7]. However, when both SES and armed conflict experiences were examined simultaneously, we observed that armed conflict remained a significant predictor of EF, whereas low SES did not predict EF any longer and also did not change the relation between armed conflict and EF. This suggests that armed conflict experiences might be a stronger risk for low EF skills in children compared to low SES. Armed conflict creates a context that children are often exposed to repeated, toxic and potentially traumatic stressors, which could lead to post-traumatic stress symptoms and associated cognitive difficulties [48] or result in structural and functional changes in the brain and cognitive functions [2, 47]. Whereas, the role of SES in EF skills might be comparably more indirect through the mediation of low parental investment, less intellectual stimulation and education opportunities for cognitive development, high parental distress, domestic violence and negative parenting practices [32-36], all of which could also result from or worsen with the armed conflict context [46, 62].

According to the social causation account [29], low SES leads to limited resources and stressful conditions, which hinder normative ToM development. Particularly, low

parental occupational status, low maternal education and associated negative parenting practices [72-74] were found to be associated with lower ToM skills in children. In agreement, in our sample, both partial correlations and path analysis showed that, after controlling for age, SES was positively associated with ToM. Higher SES might be linked to higher ToM skills via parental investment and time spent with children, as well as the nature and the quality of parent-child relationships. However, the association between armed conflict experiences and ToM skills was found nonsignificant. This finding suggests that, while political violence and the trauma it potentially causes are related to lower performance in certain cognitive skills, such as attention and memory [45, 49], and - as our findings suggested- EF, this relation might not be generalized to the overall cognitive domain. Alternatively, this finding might reflect the complex relation between threat perception and social cognition. Literature shows that threat perception can influence perceptual and attitudinal processes [75], as well as mental state understanding [76-78], but it could do so in different ways. One possibility is a quick and valid response to threat as a self-defense mechanism, which sets off socio-cognitive processes to ward off potential damage [75]. Higher social attention could in turn facilitate better mental state understanding in response to threat [76]. Another possibility, however, is that threat perception may lead to distancing and avoidance, which in turn create a barrier in mental state understanding [77]. Research indicates that a range of characteristics and interindividual differences can shape mental state understanding in the presence of a threatening stimuli or context [76-78]. Hence, the complex nature of mental state understanding in response to threat might have prevented us from observing a pattern in our sample with respect to their armed conflict experiences.

Our findings also indicated that the level of armed conflict experiences was linked to higher empathy in children. This was in line with our predictions, as well as with the literature. Studies show that children are sensitive to other people's pain and distress [23].

Furthermore, similar regions in the brain (e.g., anterior insula cortices and anterior cingulate) activates when children observe someone else in pain and when they directly experience pain [54]. Based on these behavioral and neural studies, we can argue that exposure to armed conflict, so to pain and distress of others, might increase affective sharing and empathic response in children. However, we did not observe a similar association between empathy and low SES, which also creates distress in others. Likewise, SES did not moderate the relation between armed conflict and empathy. While these results were not in line with our expectations, they are consistent with the findings showing that SES is not linked with individually assessed empathy [42,43]. The literature examining the relation between SES and empathy is limited and less conclusive, suggesting both positive and negative associations [41, 42]. It can be argued that variation in the findings can be due to contextual differences, as well as distinct assessment tools. It should also be noted that while empathy, by definition, comprises emotional response given to all affective states, among them, observation of pain has the most capacity to trigger affective sharing [54]. In the current study, we focused on affective sharing for others' physical pain. Such affective sharing and empathic concern for others' pain might be more relevant to an armed conflict context but not to SES.

This study has many strengths. Firstly, the results were not affected by shared reporter variance. Risk factors (i.e., SES and armed conflict experience) were measured with mother reports, and child outcomes were measured via individual task-based assessments. Second, our outcome assessments were comprehensive. The tasks measuring EF required engagement of different components of EF (i.e., working memory, inhibitory control, cognitive flexibility); ToM assessment included tasks measuring both first-order and second-order ToM, and the empathy task tapped both affective sharing and empathic concern. It is also worth noting that SES and armed conflict experiences accounted for medium to large parts of

the variance in EF, ToM and empathy in children. However, the findings must be interpreted with caution as the data were cross-sectional, providing information on the level of risk factors and child outcomes at a single time-point. Thus, the term predictor was used in the paper only in the statistical sense; the results do not imply any causality. In future work, longitudinal examination of child outcomes in relation to SES and armed conflict can help us reach more conclusive results.

Despite this limitation, the findings of the study are noteworthy. This, to our knowledge, is the first study exploring the EF, ToM and empathy skills in children living in a zone of low-intensity armed conflict; thereby, fills a gap and contributes to the literature. It also has important implications for cognitive, social and emotional development of children living in armed conflict zones in Turkey and beyond. According to UNICEF, in 2015 alone, 16 million babies (i.e., one in eight of all births) were born in the middle of armed conflict, and at least 250 million children (i.e., one in nine in the world) lived within a conflict zone [79]. These numbers indicate an urgent need for developing effective prevention and remediation strategies and policies in armed conflict zones. Otherwise, exposure to such adversities in early childhood might cause substantial individual costs such as non-optimal cognitive development [39], and relatedly poor social-emotional competence and self-regulation [2, 10], and poor psychological adjustment [13, 14], as well as delays in school readiness and poor school success [1]. Strategies for deterring these negative outcomes include, but are not limited to, planning evidence-based prevention and intervention programs to support young children's development and wellbeing. Our findings showed that interventions focused on promoting EF and ToM skills in children are needed in eastern Turkey. Beyond intervention programs, policies hold great potential for transforming the lives of people living in this region. Social policies can be implemented to increase parental investment and care for young children, and education policies can be shaped to increase the

weight placed on school climates for supporting cognitive skills and on access to preschool education.

Summary

EF, ToM and empathy skills play an important role in healthy child development in various areas such as cognitive performance and academic outcomes, social and emotional competence, and adaptive social behaviors. However, adverse life experiences that occur in early childhood, the period these skills advance significantly, may interfere with normative development and result in poor outcomes. In this regard, the present study aimed to investigate EF, ToM and empathy skills in children living in eastern Turkey, where socioeconomic adversity and low-intensity armed conflict may pose a risk for optimal development in children. The data were collected from 115 children (60 girls) aged 39 to 95 months (M = 68.22, SD = 14.62). Findings suggested that, overall, children's performance was low in the EF and ToM tasks, and high in the empathy task. We conducted path analysis, controlling for age, to examine the role of armed conflict experiences and socioeconomic adversity in these child outcomes. Results showed that the level of armed conflict experienced by children predicted lower EF (β = -.15) and higher empathy (β = .21), while low socioeconomic status predicted lower ToM (β = .20). These findings suggest an urgent need for developing effective prevention and remediation strategies and policies in armed conflict zones to support young children's development and wellbeing.

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