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## **Posttraumatic stress disorder symptoms and peer problems in children and adolescents exposed to maltreatment**

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*To professionals who work with abused children*





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## Resumo

**Objetivos:** Este estudo teve como objetivo analisar as associações entre a perturbação de stress pós-traumático (PSPT) e problemas com os pares, e examinar o efeito moderador do sexo naquela associação em crianças e adolescentes expostos a mau trato.

**Métodos:** Foi realizado um inquérito em Portugal no âmbito de um estudo mais amplo sobre os efeitos das adversidades precoces no desenvolvimento cognitivo e socio-emocional da criança. A amostra incluiu 121 crianças e adolescentes, entre 7 e 17 anos, expostos a mau trato. Os cuidadores das crianças e adolescentes preencheram um conjunto de questionários acerca dos mesmos, designadamente acerca da exposição a experiências adversas (violência doméstica, abuso emocional, negligência, abuso físico e abuso sexual), presença de sintomas de PSPT e problemas com os pares.

**Resultados:** Sintomas de PSPT revelaram estar associados a mais problemas com os pares. O sexo da criança emergiu como um moderador da associação entre os sintomas de intrusão e problemas com os pares. Em particular, aquela associação revelou ser estatisticamente significativa, mas apenas para os rapazes.

**Conclusões:** O presente estudo veio alargar os resultados da investigação existente sobre a temática, dominada por estudos norte-americanos, para o contexto português. Os resultados demonstraram que sintomas de PSPT em crianças e adolescentes expostos a mau-trato têm um impacto na qualidade da relação com os pares, em particular nos rapazes.

**Implicações:** Os achados deste estudo destacam a necessidade de avaliar o impacto de fatores biológicos, culturais e de género nos sintomas de trauma e no desenvolvimento social e qualidade das relações em crianças e adolescentes.

**Keywords:** abuso infantil, problemas com pares, sintomas de estresse pós-traumático, diferenças de sexo



## Abstract

**Objectives:** This study aimed to analyze the associations between posttraumatic stress disorder (PTSD) and peer problems, and to examine the moderating effect of sex on that association in maltreated children and adolescents.

**Methods:** A survey was conducted in Portugal as part of a wider study about the effects of early adversity on child cognitive and socioemotional development. The sample included 121 maltreated children and adolescents, aged 7 to 17 years. The caregivers reported on child maltreatment (domestic violence, emotional abuse, neglect, physical abuse, and sexual abuse), PTSD symptoms, and peer problems.

**Results:** Maltreatment-derived PTSD symptoms predicted more peer problems. Child sex did not influence the relationship between total PTSD scores and peer problems, although it did moderate the effect of PTSD intrusion symptoms on peer problems, with only boys showing a statistically significant association between the two variables.

**Conclusions:** This study extended North American research findings with a Portuguese community sample. The results demonstrated that maltreatment-derived trauma symptoms during childhood have an impact on social problems with peers.

**Implications:** The findings highlight the need to assess the impact of biological, cultural, and gender normative factors on child and adolescent trauma symptoms and on social development and on the quality of relationships in children and adolescents exposed to maltreatment.

**Keywords:** child abuse, peer problems, post-traumatic stress symptoms, sex differences



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## CHAPTER 1

# Introduction

The World Health Organization (WHO) provides a broad definition of child maltreatment. According to WHO (2021), child maltreatment is the set of experiences of neglect and abuse that occur under the age of 18. The concept of maltreatment includes all types of abuse, such as physical and emotional abuse, as well as neglect, sexual and/or commercial exploitation, and exposure to domestic violence. Years of research suggest that those adverse, potentially traumatic experiences can cause damages to children's dignity, development, health, and survival (Corso et al., 2008; Gerke et al., 2018). Those consequences can often last for a lifetime (Gerke et al., 2018).

The phenomenon of child maltreatment exists in various countries around the world, although it is sometimes difficult to study it cross-culturally because official statistics are lacking for many low- and middle-income countries. Also, the definition of maltreatment adopted by countries for their official reports frequently differs. However, some cross-border studies have found that nearly 3 out of 4 children in the 2 to 4 age group often experience psychological and/or physical violence perpetrated by their parents or caregivers (United Nations Children's Fund | UNICEF, 2017). Besides, around 1 in 5 women and 1 in 13 men worldwide have experienced sexual abuse in childhood (Child Abuse - Facts, Stories & How We Can End It | World Vision Australia, 2020). Other data in the Global Status Report on Preventing Violence against Children (2020) showed that only in 2017 around 40,150 children were killed in the world (for some of them, due to maltreatment), and this figure was representing about 8% of all homicides. Interestingly, the global homicide rate for children per 100,000 people was 2.4 for boys and 1.1 for girls, with the rate of boys exceeding twice that of girls (WHO, 2020).

While the issue of child maltreatment appears to be a problem per se, it can also be the cause of further difficulties and serious consequences. According to the WHO (2021), children who have been maltreated have a heightened risk for developing behavioral and psychiatric problems. Among others, maltreated children may exhibit high-risk sexual behavior, violence perpetration, and victimization (Millett et al., 2013), and they are more likely to seek mental health treatments and hospitalizations (Boxer & Terranova, 2008). As highlighted by recent

research on maltreated children, another common consequence found in such children is the presence of Post-Traumatic Stress Disorder (PTSD) symptoms (Hsieh et al., 2016), occurring alongside with other difficulties, such as peer problems (Shields & Cicchetti, 2001). This is the focus of the present study.

## **1.1. Post-Traumatic Stress Disorder and Peer Problems in Maltreated Children**

### **1.1.1. PTSD and Child Maltreatment**

PTSD is a mental health disorder that develops following exposure to traumatic experiences. According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013), to diagnose PTSD the following criteria must be present. Criterion A refers to the (direct or indirect) exposure to a stressor (as maltreatment, for instance). The second criterion, or criterion B, is the manifestation of at least one intrusion symptom. Intrusion symptoms are re-experiencing of the traumatic episode through unwelcomed disturbing remembrances, nightmares, flashbacks, emotional distress, and physical reactivity when exposed to reminders of the trauma. Criterion C is avoidance. The patient who has a diagnosis of PTSD typically would avoid trauma-related thoughts or feelings and trauma-related external reminders. Criterion D is the negative modifications in cognition and mood. The diagnosis of PTSD also requires at least two of the following characteristics: i) inability to recall key features of the trauma; ii) overly negative thoughts and assumptions about oneself or the world; iii) exaggerated blame of self or others for causing the trauma; iv) negative affect; v) decreased interest in activities; vi) feeling isolated; and vii) difficulty experiencing positive affect. Finally, as criterion E, the patient must show alterations in arousal and reactivity. Examples could be hypervigilance, difficulty concentrating, difficulty sleeping, and a heightened startle reaction. All these symptoms need to be present for over a month, they must cause functional and/or social impairment and they should not be due to other illnesses or medical treatments (American Psychiatric Association, 2013).

Typical studies of PTSD included (and still often involve) participants who survived terrorist attacks, conflicts, bombings, plane crashes, but also natural disasters such as earthquakes and floods. The first studies that described symptoms related to PTSD were



conducted with US veterans who participated in the Vietnam War (Istituto Superiore di Sanità website, 2021; Crocq & Crocq, 2000). Since then, research into this mental health disorder has permeated all age groups and investigations into many types of non-war traumatic experiences have begun to develop.

Interestingly, the DSM-5 reports additional explanations for the symptoms of PTSD in children. These are sometimes different from symptoms adults usually experience. Specifically, the DSM-5 explores and describes the symptoms of children over the age of six. Normally, in children over the age of six, PTSD correlates may include repetitive play in which themes of the trauma are conveyed, often coupled with an actual reenactment of the traumatic event during play. Furthermore, children can have scary dreams, without necessarily remembering their content, while dreams that visually depict the trauma are more predominant in adults who have a diagnosis of PTSD (Department of Health and Human Services, U.S., 2016). Just like adults, children can experience a loss of interest in their daily activities and may suffer physical symptoms such as stomach pains and headaches (NHS website, 2019; Miller et al., 2021).

Given that PTSD emerges because of exposure to one or multiple potentially traumatic events, it is not a surprise that some recent studies have revealed that PTSD diagnoses are common among children who had been maltreated (Bennett et al., 2020; S. J. Lewis et al., 2019). Indeed, in the epidemiological study conducted by Lewis and colleagues in England and Wales, it was presented graphically and numerically how most of the children and adolescents in the representative sample diagnosed with PTSD had experienced a direct interpersonal threat or aggression, such as, *inter alia*, maltreatment by adults (Lewis et al., 2019). Furthermore, in another study by Kilpatrick and colleagues, authors found that exposure of children to physical and sexual abuse can increase the likelihood of developing diagnostic comorbidity of PTSD with major depression and substance addiction (Kilpatrick et al., 2003).

### **1.1.2. Peer Problems and Child Maltreatment**

Peer relationships are important in childhood for future psychosocial functioning. Both activities that are usually carried out within peer groups and one-to-one relationships can influence incredibly diverse developmental outcomes in children (Parker et al., 2006). Indeed, through socialization with peers, children understand social skills and norms, as well as practice several abilities essential for interpersonal relationships. According to Boivin (2005), children as young as four years of age can already decide which of their peers is their best friend and

which children they dislike (Boivin, 2005). However, it has also been estimated that between 5% and 10% of children experience problems in relationships with peers. Unsurprisingly, problems with peers in childhood can negatively affect social development during adulthood. The reason for this is that the first years of life are critical for the development of many interpersonal skills. Examples can be the regulation of emotions, the inhibition of impulses, attention processes, and social learning (Hay, 2005).

The most common peer problems are peer bullying and victimization, and these can often be combined with other psychosocial difficulties such as conduct disorder or even major depressive symptoms (Hersen, 2005). Peer problems are usually intrinsically related to behavioral problems. Children who are more aggressive and hyperactive may experience greater rejection by peers (Boivin, 2005). Furthermore, absent prosocial behavior can also stimulate peer rejection (Tremblay et al., 2014).

Peer problems can cause various difficulties in children's lives, as already suggested above, with both short- and long-term consequences. In the short term, peer problems are generally associated with poor academic performance (Mundy et al., 2017) and poor motivation (Furrer et al., 2014). Children who are more easily accepted and have many friends usually have a higher motivation to participate in class activities (Furrer et al., 2014). In the long run, peer problems in childhood are associated with school dropout, emotional conditions such as anxiety, depression, and loneliness, and delinquent behavior (Boivin, 2005; Reijntjes et al., 2010).

One category of young people who is at a greater risk of experiencing problems with peers in both childhood and adolescence is young victims of maltreatment. It has been shown that children victims of maltreatment are more likely to bully others when compared to a sample of non-maltreated children, with bullying rates being more prevalent among physically and sexually abused children. Interestingly, at the same time, maltreated children are also more likely to suffer peer victimization (Shields & Cicchetti, 2001). Yet, another famous study highlighted that chronic maltreatment in children seems to be linked to a heightened risk of peer rejection, as well as a risk of aggressive behavior reported by teachers, peers, and children themselves. And these results were accounting for both children and adolescents (Bolger & Patterson, 2001). Another research found similar results, but it also showed that externalizing and internalizing problems due to child maltreatment were more accentuated when the

maltreatment occurred chronically during early developmental periods, rather than when they occurred in only one developmental stage (Jaffee & Maikovich-Fong, 2011).

As a matter of fact, in addition to the formation of the emotional and social problems that have been analyzed so far, studies suggest that different types of childhood maltreatment can impair social functioning later in life. A study conducted by Nkuba and colleagues with a Tanzanian sample (Nkuba et al., 2018) found that an association existed between the violence perpetrated by parents during childhood and several adolescents' mental health difficulties, such as peer, conduct, and emotional problems. Additionally, a more detailed study suggested that physical functioning seems to be affected by psychological aggression, while emotional functioning seems to be altered more strongly by neglect, a particular form of child maltreatment (Lo et al., 2019). Likewise, another previous piece of research had already found that child maltreatment can predict dating violence during adolescence, especially when this relationship was mediated by the occurrence of trauma-related symptoms (Wolfe et al., 2004).

## **1.2. Is PTSD a Possible Predictor of Peer Problems?**

As suggested above, research has been documenting that maltreated children often accumulate multiple difficulties, including mental health problems, such as PTSD symptoms, and other problems related to the quality of their relationships, such as peer problems (Bolger & Patterson, 2001; Jaffee & Maikovich-Fong, 2011; Shields & Cicchetti, 2001). Interestingly, research has been highlighting links between difficulties with peer relations and the presence of PTSD symptoms (Graham-Bermann & Levendosky, 1998; Levendosky et al., 2002; Saigh et al., 2002). Despite such findings, the associations between PTSD and peer problems have been poorly explored among maltreated children. Our study aims to contribute to such literature, by exploring whether PTSD symptoms predict peer problems in a sample of maltreated children and adolescents.

The domains of impairment of people exposed to complex trauma range from attachment to behavioral control and from cognition to affect regulation (Fowler et al., 2013; Qureshi et al., 2011). Specifically, some problematic consequences of trauma in children are poor modulation of impulses, self-destructive and oppositional behavior, aggression, and difficulty in complying with rules, as well as the possible reenactment of trauma in play (Cook et al., 2005).

Exposure to trauma has been shown to lead to altered measures of brain functioning in children. Particularly, alterations happen in the hippocampus, in the cortical structural development, and in cardiovascular functioning. And all of that can result in problems relating to emotional, social, and behavioral functioning (Perry, 2008). Moreover, children and adolescents who have been diagnosed with PTSD seemed to have a significantly larger hippocampus than the children in the control group in a study conducted by Tupler and De Bellis (2006), which, among other conclusions, stated that hippocampal volume was positively related to psychopathology, predominantly in regards of externalizing behavior (Tupler & De Bellis, 2006). Saigh and colleagues (2002) found that significant variations in Child Behavior Checklist (CBCL) scores were linked with PTSD diagnosis, but they were not associated with exposure to exceptional stress when a diagnosis of PTSD was not present (Saigh et al., 2002).

Research has been suggesting, as well, that PTSD symptomatology may be associated with peer difficulties. In a study carried out by Levendosky and colleagues (2002), researchers found that reexperiencing the trauma, which is a common symptom of PTSD, was associated with peer problems and externalizing behaviors (Levendosky et al., 2002). Yet, a previous study suggested that children with PTSD symptoms had more externalizing behaviors than children who did not show any trauma symptoms (Graham-Bermann, Sandra Levendosky, 1998). Moreover, Hébert and colleagues (2016) stated that peer victimization increases the odds by up to three-fold for a clinical diagnosis of PTSD and that peer victimization could represent a risk factor for developing mental health symptoms that can be signals for PTSD and dissociation (Hébert et al., 2016). These findings suggest possible positive associations between PTSD and peer problems.

Going one step further, a study demonstrated, through logistic regression analyses, that posttraumatic stress symptoms were predicting self-reported peer victimization in a sample of sexually abused children (Amelie Tremblay-Perreault et al., 2017). This result represents a valuable aspect of the inquiry regarding the relationship between PTSD and peer problems because it asserts that a causal relation could exist between these two phenomena. Moreover, since the research was conducted with sexually abused children, we have a reason to believe that this relationship could also hold in a sample of children who suffered other forms of maltreatment.

While it has been proven that PTSD symptoms are associated with peer problems, less is known about this relationship in maltreated children. The research literature that explores this

specific population is very scarce and it involves mostly limited age ranges. According to a study by Milot and colleagues (2010), in a sample of maltreated preschoolers, trauma-related symptomatology has been found to have a role in the development of psychosocial problems (Milot et al., 2010). Furthermore, in another study, these variables have been analyzed in a sample of Taiwanese college students who had experienced childhood maltreatment. Early physical maltreatment was predicting both trauma-related symptoms and behavioral problems (Shen, 2009). These findings, although deserving confirmation, support the possibility that the presence of PTSD symptoms may be associated with more peer problems among maltreated children. We will pursue this line of inquiry.

Also, empirical findings have been suggesting the existence of sex differences in both PTSD symptoms and peer problems, with males exposed to adversity showing generally more difficulties than females, although mixed results have been produced. Given such results - described below in more detailed - one may thus suspect that child sex may act as a moderator of the relationship between PTSD and peer problems among maltreated children and adolescents. This study also aims to explore this issue.

### **1.3. Is Child Sex Moderating the Above Relationship?**

As previous research has shown, child sex can have a role in many psychological conditions, even from an early age. In fact, biological differences seem to contribute to many disorders (Bao & Swaab, 2010), including PTSD. Although the prevalence of PTSD seems to be higher in females than in males (Kessler et al., 1995), with females having PTSD symptoms for longer periods than males (Christiansen & Elklit, 2012), research has been revealing that the severity of PTSD, including dissociative symptoms, is more pronounced among males than females (e.g., Ramos et al., submitted). Moreover, according to a literature review carried out by Christiansen and Elklit (2012), males seem generally to be more exposed to potentially traumatic events than females. A similar result was recently reported in a Portuguese study about the presence of PTSD symptoms in children and adolescents (Ramos et al., submitted).

Interestingly, a study conducted by Norris and colleagues (2001) highlighted that culture can play a major role in sex differences in symptoms of PTSD. Specifically, those authors examined samples formed by White American, Mexican, and African American participants and found that the Mexican culture amplified sex differences in PTSD symptomatology, while the African American culture weakened them. According to their view, these results were due

to differences in culturally defined gender roles. Sex variations in PTSD seemed to be greater in cultures in which traditional interpretations of femininity and masculinity were in place (Norris et al., 2001).

Studies have also shown that PTSD in children is associated with specific brain development modifications, with different results being reported for males and females (Perry, 2008; Tupler & De Bellis, 2006). Although less research about sex differences has been carried out with children exhibiting maltreatment-related posttraumatic stress disorder, some research findings deserve consideration. A study conducted by De Bellis & Keshavan (2003) demonstrated that participants who had been diagnosed with PTSD due to child maltreatment were not showing the growths of the corpus callosum area and its regions that should take place as age increases, but this finding was especially true for males rather than for females (De Bellis & Keshavan, 2003). Another research has suggested that females with a history of abuse seem to be more resilient to the neurological effects, although they are less resilient to the psychiatric symptomatology derived from maltreatment during childhood (Samplin et al., 2013). These findings suggest that there are biological effects of PTSD on peer problems and that these effects may differ depending on the sex of the children.

Furthermore, there is evidence that trauma is related to externalizing problems, especially among males (Gauthier-Duchesne et al., 2017; Wamser-Nanney & Cherry, 2018) and that externalizing problems are linked to more peer problems (Reijntjes et al., 2011). These results also support the possibility that child sex may be a moderator of the relationship between PTSD and peer problems. Whether this possibility holds true among maltreated children and adolescents is yet to be tested.

In line of the findings reported above, another set of research focused on peer problems in youth also found sex-differentiated results. In the review carried out by Rose & Rudolph (2006), authors concluded that boys have increased probabilities of developing peer problems, especially in the form of antisocial conduct and aggression, while they are less likely to develop emotional problems. On the other hand, girls are expected to show more emotional problems, such as anxiety, depression, and low self-esteem than behavioral ones (Rose & Rudolph, 2006). Additionally, according to a study by Felix and McMahon (2007), peer victimization was very common among youth and it was influenced by the sex of the children. Precisely, they assessed whether different kinds of peer victimization experiences could affect beliefs about the appropriateness of aggression in boys and girls and they concluded that boys believed more

than girls that aggression could be justifiable even in situations without a provocation, and this was true especially for the ones who had been sexually harassed in the past (Felix & McMahon, 2007). However, it seems that boys and girls experience very different forms of peer victimization, with boys having higher rates of assault victimization and bullying and girls experiencing higher rates of sexual victimization (Finkelhor et al., 2005).

Although many studies over the years have addressed the issue of sex differences in peer problems, extremely limited research has explored this question in the maltreated child population. To our current knowledge, one of the few pieces of research available on this issue is a study conducted in Sweden which, however, only analyzed the behavioral effects of emotional maltreatment. Predictably, the researchers found that emotional abuse was affecting externalizing behaviors. Surprisingly, however, no significant differences were found between boys and girls. Indeed, the researchers were unable to find a specific pattern for externalizing behaviors typical of the maltreated boys or girls (Hagborg et al., 2017). On the other hand, however, another study found opposite evidence. Indeed, authors have found that being male was predicting greater social problems in a sample of sexually abused children (Blanchard-Dallaire & Hébert, 2014) and that greater social problems are related to more peer problems (Reijntjes et al., 2011). Given such mixed findings, more research on this topic is clearly needed.

#### **1.4. The Present Study**

Since there is evidence i) that maltreated children and adolescents are at a greater risk for developing both PTSD and peer problems, ii) that PTSD can be a risk factor for the development of peer problems, and iii) that PTSD has also a negative impact in several other domains of child functioning (e.g., externalizing behaviors) linked to the quality of peer relations, especially among males, we proposed herein to test the relations between the above variables. More specifically, the present study aims to address whether PTSD symptoms predict more peer problems among maltreated children and whether child sex acts as a moderator in such alleged association. Explicitly, we hypothesized that: Hypothesis 1) Posttraumatic Stress Disorder (PTSD) will predict peer problems among maltreated children and adolescents; and Hypothesis 2) child sex moderates the relationship between PTSD and peer problems in maltreated children and adolescents, such that the relation between PTSD and peer problems is stronger for boys than for girls.

The data of the present study are intended to contribute to a clearer understanding of the complex relationship between trauma and peer relations, as well as the possible sex effects that could have a role in this association. Particularly, the results are envisioned to explore whether peer problems are a possible consequence of PTSD symptoms that arise following a specific kind of traumatic involvement such as child maltreatment. Since child maltreatment is associated with peer victimization, rejection, bullying and impaired physical and emotional functioning, an implication of the present study could be the design of new PTSD psychosocial interventions, involving the issue of peer problems as a possible correlate of the most common PTSD symptoms, while highlighting possible difference trajectories and intervention needs among males and females.



## CHAPTER 2

# Method

### 2.1 Sample and Procedure

The present study included 121 maltreated children and adolescents (52.1% girls and 47.9% boys), aged 7 to 17 years ( $M = 11.4$ ,  $SD = 3$ ), as well as their respective caregivers. The total number of maltreatment incidents that each child or adolescent suffered ranged from one to four ( $M = 1.4$ ,  $SD = 0.7$ ). Importantly, 69.4% ( $n = 84$ ) of children and adolescent experienced one kind of maltreatment, while 2.5% ( $n = 3$ ) went through up to four different forms of maltreatment experiences. Less than one in three children or adolescents ( $n = 37$ , 30.6%) was receiving psychological or psychiatric treatment at the time of assessment. Almost all children and adolescents were Portuguese nationals ( $n = 119$ , 98.3%), 47.1% ( $n = 57$ ) were not living with their fathers at time of assessment, and 17% ( $n = 21$ ) of the sample was currently living with a stepfather or a stepmother in the household.

Caregivers also participated in this study. Most of them were the mothers ( $n = 114$ , 94.2%), four (3.3%) were the fathers, two were the aunts (2%) and one was the stepmother (0.5%). Almost 60% ( $n = 71$ ) of the caregivers were married or were living in a civil union. Forty percent ( $n = 50$ ) of them were separated or divorced or were single parents. Moreover, 2.5% ( $n = 3$ ) of the caregivers had six years of formal education, 9.1% ( $n = 11$ ) had nine years of education, 38.8% ( $n = 47$ ) had a high school diploma, 40.5% ( $n = 49$ ) had a bachelor's degree and 9.1% ( $n = 11$ ) had a master's degree or a PhD. Around 20% ( $n = 24$ ) of the caregivers were unemployed (Table 1).

This study is part of a larger research project about the effects of early adversities on child socioemotional and cognitive development. The project was approved by the Ethics Committee of ISCTE-IUL. Caregivers were recruited among local school parent associations. To be eligible, participants should be 18 years or older and be the parents or legal guardians of a child or adolescent between 7 and 17 years of age. Informed consent was obtained from all caregivers, who then completed an online survey through *Qualtrics*. Caregivers were asked to filled out a sociodemographic questionnaire, the Portuguese parent/caregiver-report version of the UCLA PTSD Reaction Index for DSM-5 (Ramos et al., 2021, submitted) and the peer

problems-related items from the parent/caregiver-report version of the Strength and Difficulties Questionnaire (SDQ) (Goodman, 1997).

## 2.2 Measures

**Sociodemographic questionnaire.** Caregivers completed a sociodemographic questionnaire composed of 25 questions about their child and themselves. As for the children, caregivers were questioned, for example, about their sex, age and year of schooling. As for the caregivers, questions concerned, for example, caregivers' age, educational qualification, employment and marital status.

**UCLA PTSD Reaction Index for DSM-5, Parent/Caregiver-Report version (RI-5;** Ramos et al., 2021, submitted; Steinberg et al., 2013). Post-traumatic stress disorder symptoms were assessed using the Portuguese parent/caregiver-report version of the RI-5 (Ramos et al., 2021, submitted). This scale examines trauma events and PTSD symptoms of children and adolescents aged 7 to 17.

In the first part of this measure, and according to the criterion A of the DSM-5, the RI-5 assesses whether the child had been exposed to 22 different kinds of traumatic experiences (i.e., disasters, sexual abuse, physical abuse, physical aggression, negligence, sexual exploitation, emotional abuse, interference in the provision of care, sexual assault, kidnapping, terrorism, mourning, separation, war, forced displacement, community violence, domestic violence, serious accidental injury, school emergency, disease, bullying and suicide witnessing). For this study, only children exposed to maltreatment were considered. Specifically, data showed that 62.8% ( $n = 76$ ) of children and adolescents were victims of or witnessed domestic violence, 29.8% ( $n = 36$ ) experienced emotional abuse, 27.3% ( $n = 33$ ) were exposed to neglect, 16.5% ( $n = 20$ ) to physical abuse, and 5% ( $n = 6$ ) to sexual abuse.

The second part of the RI-5 screens for PTSD symptoms. The scale has 31 items and includes four subscales: intrusion symptoms (also referred to as criterion B, 5 items), avoidance (criterion C, 2 items), negative modifications in cognition and mood (criterion D, 13 items), and alterations in arousal and reactivity (criterion E, 7 items). A typical item addressing specifically the criterion B is *“My child feels that they have returned to the time during which bad things happened to them as if they were reliving what happened”*, while a representative item tackling criterion C is *“My child tries to avoid people, places, or things that remind them*

*of what happened*". An example of a question asked for criterion D is *"My child feels that what happened to them was sick or disgusting"* and, lastly, a sample question to assess criterion E is *"My child is alert to dangerous situations or things they are afraid of (for example, they look behind their shoulders, even when at that moment nothing justifies it)"*. Items are answered on a five-point Likert scale ranging from 0 (*none of the time*) to 4 (*most of the time*). Furthermore, the scale also allows the calculation of a total PTSD score: the higher the score, the more PTSD symptoms. In the Portuguese validation study, the RI-5 total score showed good internal consistency reliability ( $\alpha = .89$ ).

**Strength and Difficulties Questionnaire (SDQ; Goodman, 1997).** Peer problems were measured with five items representing the peer problem dimension of the parent/caregiver-report version of the SDQ. The SDQ is a psychometric instrument assessing for emotional and behavioral problems in children and adolescents who are aged 4 to 17. Caregivers are invited to rate 25 child psychological attributes displayed in a six months period prior to the questionnaire administration. The SDQ comprises five subscales, assessing emotional symptoms (5 items; Item 8, *"Many worries, they often seem worried"*), conduct problems (5 items; Item 5, *"Often has temper tantrums or hot tempers"*), hyperactivity (5 items; Item 21, *"Thinks things out before acting"*), peer problems (5 items; Item 6, *"Rather solitary, tends to play alone"*), and prosocial behavior (5 items; Item 9, *"Helpful if someone is hurt, upset or feeling ill"*). Items are answered on a three-point Likert scale ranging from 0 (*it is not true*) to 2 (*it is very true*). Given the purposes of the present study, only the peer problems subscale was considered (Cronbach alpha = .65), with higher scores representing more peer difficulties.

### **2.3 Analytic Strategy**

First, correlations between study variables were performed. Then, moderation analysis were conducted to assess the moderating role of child sex in the relation between PTSD and peer problems. The moderation analysis were performed using the PROCESS macro for SPSS (Hayes, 2017), a software used for moderation and mediation analyses that utilizes a regression-based analytic approach to estimate moderation models (Hayes, 2017). In the first model, PTSD total score was inputted as the independent variable, peer problems were inputted as the dependent variable, and child sex was inputted as the moderator variable. Other moderation models were then tested, considering each PTSD criterion (i.e., B, C, D and E). Child age and number of maltreatment incidents were included in the analysis as control variables. The

significance level was set at alpha level  $< .05$ . All the statistical analyses were conducted in IBM® SPSS® Statistics software (SPSS) (IBM Corp. Released 2020).

**Table 1***Sociodemographic Characteristics of Participants*

Sociodemographic characteristic	Sample	
	<i>n</i>	%
Child sex		
Female	63	52.1
Male	58	47.9
Nationality		
Portuguese	119	98.3
Other	2	1.7
Kinship		
Mother	114	94.2
Father	4	3.3
Other	3	2.5
Marital status		
Single	22	18.2
Married/civil union	71	58.7
Divorced/separated	26	21.5
Widower/widow	2	1.7
Highest educational level		
6 years of schooling	3	2.5
9 years of schooling	11	9.1
12 years of schooling	47	38.8
Bachelor's degree	49	40.5
Master's degree/PhD	11	9.1
Employment		
Unemployed	24	19.8
Employed	97	80.2
Total number of maltreatment incidents	59	39.3
1	84	69.4
2	27	22.3
3	7	5.8
4	3	2.5
Psychological/psychiatric treatment	37	30.6



## Results

### 3.1 Descriptive Statistics and Correlational Analyses

Table 1 contains means for the main study variables, while Table 2 presents bivariate correlations. Results indicated that there was a significant positive association between PTSD total score and peer problems ( $r = .47, p < .001$ ). Furthermore, each single PTSD criterion, namely B, C, D and E, was positively and significantly correlated with peer problems scores (criterion B:  $r = .22, p = .018$ ; criterion C:  $r = .24, p < .001$ ; criterion D:  $r = .49, p < .001$ ; criterion E:  $r = .39, p < .001$ ). Lastly, the number of maltreatment incidents was positively correlated with PTSD total score ( $r = .33, p < .001$ ), and B ( $r = .23, p = .010$ ), D ( $r = .31, p < .001$ ) and E ( $r = .32, p < .001$ ) criteria, and moderately correlated with peer problems ( $r = .16, p = .083$ ). No other significant associations were found in the present study (Table 2).

**Table 2**

*Descriptive Statistics and Correlations between Study Variables*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Age	11.41	3.02	—								
2. Maltreatment incidents			-.04	—							
3. PTSD total scale	42.02	11.19	.05	.33**	—						
4. Criterion B	7.50	2.68	-.12	.23*	.76**	—					
5. Criterion C	3.50	1.84	.09	.09	.53**	.52**	—				
6. Criterion D	18.79	5.53	.15	.31**	.93**	.60**	.34**	—			
7. Criterion E	12.24	3.84	-.02	.32**	.81**	.39**	.22*	.68**	—		
8. Child sex			.38	-.05	-.11	-.05	-.12	-.04	-.18*	—	
9. Peer problems	1.91	1.98	.06	.16	.47**	.22*	.24**	.49**	.39**	-.13	—

### 3.2 Predicting Peer Problems: The Role of PTSD and Child Sex

To explore if PTSD symptoms predicted peer problems and whether this relation was moderated by child sex, moderation models in the PROCESS macro (Hayes, 2017) for SPSS version 27.0 (IBM Corp. Released 2020) were carried out. Child age and the number of maltreatment incidents were entered in all models as control variables.

For **PTSD total score**, the overall model proved significant ( $R^2 = .23$ ,  $F(5,115) = 6.761$ ,  $p < .001$ ) and the total PTSD score was found to be a significant predictor of peer problems ( $b = .103$ ,  $t = 2.204$ ,  $p = .029$ ). The interaction between PTSD total score and child sex did not reach statistical significance ( $b = -.016$ ,  $t = -.522$ ,  $p = .602$ ).

For **PTSD criterion B score**, the overall model was significant ( $R^2 = .12$ ,  $F(5,115) = 6.761$ ,  $p = .014$ ), and criterion B was a predictor of peer problems ( $b = .571$ ,  $t = 2.711$ ,  $p = .008$ ). There was a significant interaction between criterion B score and child sex ( $b = -.283$ ,  $t = -2.140$ ,  $p = .034$ ). Particularly, the simple slope for males was  $.288$ ,  $p = .003$ , while the simple slope for females was  $.005$ ,  $p = .961$  (see Figure 1).

For **PTSD criterion C**, the overall model was significant ( $R^2 = .10$ ,  $F(5,115) = 2.559$ ,  $p = .031$ ), but criterion C was not a significant predictor of peer problems ( $b = .600$ ,  $t = 1.955$ ,  $p = .053$ ). There was a nonsignificant interaction between criterion C score and child sex ( $b = -.248$ ,  $t = -1.288$ ,  $p = .200$ ).

For **PTSD criterion D**, the overall model was significant ( $R^2 = .25$ ,  $F(5,115) = 7.730$ ,  $p < .001$ ). Criterion D was a significant predictor of peer problems ( $b = .200$ ,  $t = 2.173$ ,  $p = .032$ ), but the interaction between criterion D and child sex did not reach statistical significance ( $b = -.018$ ,  $t = -.301$ ,  $p = .764$ ).

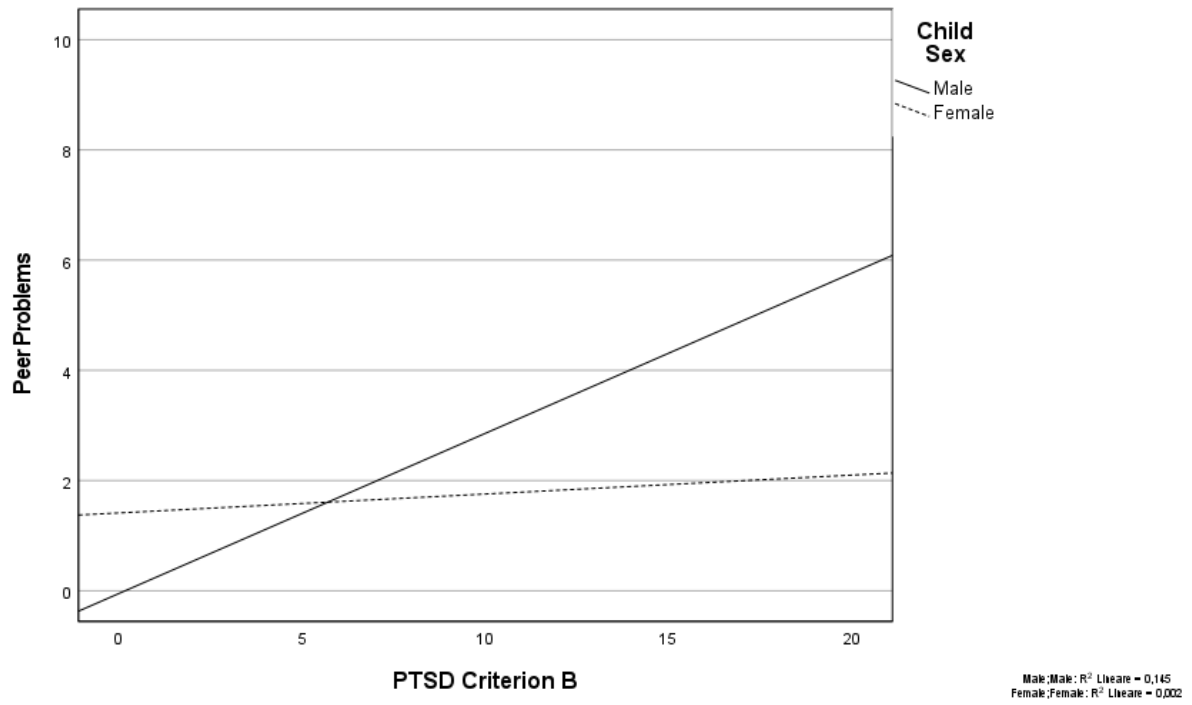
For **PTSD criterion E**, the overall model proved again to be statistically significant ( $R^2 = .18$ ,  $F(5,115) = 5.026$ ,  $p < .001$ ), but criterion E was not a significant predictor of peer problems ( $b = .008$ ,  $t = .053$ ,  $p = .958$ ). There was a nonsignificant interaction between criterion E and child sex ( $b = .125$ ,  $t = 1.375$ ,  $p = .172$ ).

Finally, and regarding all models, child age and the number of maltreatment incidents were not significantly associated with peer problems.



**Figure 1**

*Moderation Analysis*





## CHAPTER 4

# Discussion

The goal of the present study was to address whether PTSD symptoms predict more peer problems among maltreated children and whether child sex acts as a moderator in such supposed association. Regarding the results, the present study demonstrated a positive association between PTSD symptoms and more peer problems. This finding is supported by the work of Tremblay-Perreault (2017), showing that child sexual abuse-derived PTSD predicts peer victimization (Amelie Tremblay-Perreault et al., 2017). Additionally, the data of the present study add numerous substantial contributions to Tremblay-Perreault and colleagues (2017).

The first contribution is that this association between trauma and peer problems seems to hold for children who experienced a broader range of maltreatment incidents that are not exclusively limited to sexual abuse. In fact, in the present study, the sample included children and adolescents who suffered several forms of child maltreatment (i.e., domestic violence, physical abuse, emotional abuse and, neglect, other than sexual abuse). These results confirm the claims of some researchers who studied the relationship between several kinds of childhood maltreatment and peer problems, and concluded that child abuse and neglect can predict peer relation difficulties (DePrince et al., 2009; Éthier et al., 2004; Nadeau et al., 2013; Thompson & Tabone, 2010; Toth et al., 2000). Specifically, some studies explored solely the association between specific kinds of maltreatment incidents and behavioral and emotional problems (e.g., child neglect; Nadeau et al., 2013) or domestic violence (DePrince et al., 2009), while others focused on the impact of a broader range of maltreatment incidents or alleged maltreatment experiences on persistent behavioral and emotional dysfunctions (Éthier et al., 2004; Thompson & Tabone, 2010).

In addition, child maltreatment has been individuated as a possible predictor of cognitive consequences, which are then linked to peer problems. For example, in a significant qualitative study, Toth and colleagues (2000) analyzed narrative representations of maltreated and non-maltreated children through a structured narrative story-telling task and revealed that the narratives of maltreated preschoolers included more conflictual themes, which, in turn, were

partially mediating the direct relationship between child maltreatment and externalizing behavior problems (Toth et al., 2000). Finally, in another relevant piece of research by DePrince and colleagues (2009), the authors highlighted other two key elements in the area of the complex relationship between maltreatment and peer problems. Considering a community sample of children who were victims of domestic violence, the authors firstly concluded that childhood maltreatment significantly impairs executive function performance, which, again, in turn, can lead to the onset of peer problems. Furthermore, at the same time, they emphasized how the trauma connected to the abuse experience is a predictor of peer problems (DePrince et al., 2009). As a result, the trauma derived from maltreatment seems to play a significant role in the prediction of peer problems.

In this regard, a second contribution to the findings of Tremblay-Perreault and colleagues (2017) is that abuse-derived PTSD is associated not only with peer victimization, but it seems to predict peer problems more in general. Examples are loneliness, peer rejection, teasing, and poor relationships with peers. In line with this hypothesis, other studies had already established direct links between sexual abuse-derived trauma and social adaptation in school (Amédée et al., 2019), social difficulties (Blanchard-Dallaire & Hébert, 2014), and behavior problems (Amélie Tremblay-Perreault & Hébert, 2020). Besides, some other pieces of research were even able to connect childhood maltreatment-derived trauma to interpersonal revictimization later in life (Auslander et al., 2018; Benedini et al., 2016).

The literature proposes several possible explanations elucidating why maltreatment-derived trauma is associated with peer problems. The first important enlightenment is already included in the definition and symptoms of PTSD. Indeed, one of the most common PTSD symptoms is avoidance, which is a warning sign facilitating peer problems. Musicaro and colleagues (2020) found that children who have experienced interpersonal trauma can suffer extreme forms of avoidance and exhibit behaviors that can resemble sluggish cognitive tempo (SCT) symptoms (Musicaro et al., 2020). Therefore, it is not surprising that children who are victims of traumatic events can eventually behave lethargically and act withdrawn so much so that their relationship with peers is impaired. Furthermore, on a similar note, another recent study has recognized parental abuse, neglect, family conflicts, and negative family interactions as predictors of depressive symptoms in adolescence (Jeon et al., 2020). Interestingly, among depressive symptoms, some “social” symptoms concern the relationship with peers and friends. Specifically, people who have been diagnosed with clinical depression are usually feeling

irritable, intolerant of others, and can avoid friends and social activities (DSM 5; American Psychiatric Association, 2013). Given that depression has a high comorbidity with PTSD (Campbell et al., 2007), it can be argued that the “social” symptoms exhibited in young patients with depression do not vary from the ones showed in abuse-related PTSD.

On the other hand, further possible explanations come from research in the neurological and cognitive fields. According to Lim and colleagues (2014), individuals who have been exposed to child abuse can show consistent gray matter abnormalities in the ventrolateral prefrontal-limbic-temporal regions of the brain which are usually responsible for the functions of affect and cognitive control. As a result, they have observed how these exact functions are impaired in a maltreated population (Lim et al., 2014). Certainly, compromising cognitive control and affect could even lead to the development of peer problems. In line with this research, another key input has been given by Mclaughlin and colleagues (2015). In their study exploring how neural systems work in maltreated children, they concluded that child abuse intensifies the salience of negative emotional stimuli (Mclaughlin et al., 2015). Here, again, it has been proven how child maltreatment can impair emotion regulation, which, in turn, could lead to relational problems with peers. Lastly, a very recent meta-analysis has been able to include all the above-mentioned elements determining that child maltreatment is associated with i) increased avoidance, ii) emotional suppression, iii) emotion dysregulation and iv) expression of negative emotions in response to stress (Gruhn & Compas, 2020). All these findings support the results of the present study stating that abuse-derived trauma is associated with peer problems.

Finally, the last contribution concerns the cultural context of the results. Given that nearly all the above-mentioned studies were conducted in the North American context, the present study tries to widen the area of generalization of results, as they had been found to hold even in Portugal, a country that is culturally very different from Canada and the United States of America, especially when it comes to the Individualism/Collectivism and the Uncertainty Avoidance Hofstede’s cultural dimensions (Hofstede, 1983). Particularly, a study has shown that individualistic versus collectivistic cultural dimensions can significantly contribute to the course and severity of PTSD symptoms, as well as to the relationship quality and community integration following traumatic experiences (Maercker & Horn, 2013). Furthermore, another research has indicated that peer problem subscale scores of the Strength and Difficulties Questionnaire (SDQ; Goodman, 1997) from collectivistic cultures can be significantly altered,

with collectivistic cultures scoring generally higher than individualistic cultures (Yao et al., 2009). However, the results on the reliability of the SDQ subscales from studies conducted in different countries are not consistent (Richter et al., 2011).

Assumed that Portugal has a collectivistic culture according to Hofstede's cultural dimensions (1983), another possible explanation of the association between trauma-derived PTSD and peer problems lies in the cultural and social realm. Maercker and Horn (2013) have developed the Socio-Interpersonal Model, a framework elaborating interpersonal and social processes in PTSD. Their goal is exactly complementing the already existing models which link PTSD and social difficulties via neurological and biological dysfunctions originated from the trauma. Instead, in their model, they propose that three distinct factors or layers can affect the relationship quality of people who suffered traumatic experiences. The first two layers are represented by the individual's social affective response to trauma (e.g., anger, guilt, revenge) and close relationships (e.g., disclosure, empathy, and negative exchange), while the third bigger layer is represented by culture and society. Within this more distant factor, there are cultural value orientations and the societal acknowledgment of the trauma or injustice. In short, undoubtedly, the most relevant element of Maercker and Horn's model is that societal stress can contribute to the exhibition of both PTSD symptoms and social difficulties associated with them (Maercker & Horn, 2013). As a result, as highlighted by Wigham and Emerson (2015), societal feedback happening at both the micro-level (e.g., at the interpersonal level) and the macro-level (e.g., culture) can be mediating variables in the development of trauma symptoms and their consequences (Wigham & Emerson, 2015). Thus, future research should go in this direction, investigating societal effects on the development of PTSD symptoms and, consequently, peer problems. However, all considered, the results of the present study suggest that the findings from Portugal are in line with other research outcomes coming from North American countries.

Secondly, the present study showed that child sex acts as a moderator of the relationship between PTSD intrusion symptoms and peer problems such that this association is stronger for boys than for girls. This analysis supports the findings anticipated by Gauthier-Duchesne and colleagues (2017) claiming that child sex can be a predictor of both PTSD and externalizing problems (Gauthier-Duchesne et al., 2017). In addition, the data of the present study add some significant elements.

The first key contributions of the present study are that it demonstrates that PTSD and adjustment problems are linked through a predictor-outcome relationship, while sex is a moderator of that association. As reported above, PTSD and peer problems are not two independent consequences of sex differences, but they are highly related to each other. Indeed, the literature suggests that sex can moderate brain stress and its behavioral correlates in human and animal subjects exposed to early maltreatment (White & Kaffman, 2019). While this assumption has inspired over the years several pieces of research on whether sex moderates the consequences of child maltreatment, relatively few studies have paid attention to whether sex-differentiated developmental courses may be at the basis of those psychological and behavioral outputs (White & Kaffman, 2020). Even though female and male psychophysiology and brain structures are quite similar, there are certainly some sex-linked characteristics that differ. For instance, an eminent distinction regards sex hormones. This changeability in hormones influences the exhibition of symptoms of psychopathology and is also involved in the sex-differentiated responses to stress (Gillies & McArthur, 2010). Despite the entity of these biological differences, most of the studies about trauma and peer problems do not account for sex. In this area, some exceptions are represented by some experimental and imaging studies (De Bellis, Keshavan, Frustaci, et al., 2002; De Bellis, Keshavan, Shifflett, et al., 2002; De Bellis & Keshavan, 2003; Gershon et al., 2008; Hébert et al., 2018; T. Lewis et al., 2016; Thomas & De Bellis, 2004). Moreover, in the literature review carried out by White and Kaffman (2019), additional studies are mentioned about differences in the connectivity and activation of the prefrontal cortex in males and females (White & Kaffman, 2019). Because of that, in an editorial article, the expression “problematic unisex assumption” is introduced exactly to refer to the issue of sex differences in psychopathology and consequent behavioral outputs in the context of childhood maltreatment (White & Kaffman, 2020).

A second element that the present study brings about is that maltreated boys seem to be the ones for whom the relationship between PTSD intrusion symptoms and peer problems is stronger. These results confirm the claims of a systematic review carried out by Gershon and colleagues (2008) in which more than 50% of the studies conducted with maltreated adolescents reported significant moderation effects for sex. Specifically, in that review, the main finding was that males exposed to child maltreatment were experiencing much worse clinical outcomes than girls. Moreover, other pieces of research consolidated this finding. For instance, a study stated that maltreated boys were showing both higher internalizing and externalizing behavioral problems than maltreated girls (Lewis et al., 2016), while another research found sex as a

moderator of the relationship between child sexual abuse, alexithymia, and mental health, demonstrating that the associations between these variables were stronger for boys (Hébert et al., 2018).

Furthermore, some articles have been published which have explored brain-level modifications caused by PTSD in maltreated boys and girls (De Bellis, Keshavan, Frustaci, et al., 2002; De Bellis, Keshavan, Shifflett, et al., 2002; De Bellis & Keshavan, 2003; Thomas & De Bellis, 2004). Findings concluded that, after the trauma of abuse and a clinical diagnosis of PTSD, the dimensions of the hippocampus and the corpus callosum were much more reduced in maltreated boys than in maltreated girls (De Bellis & Keshavan, 2003). Also, through a sex-differentiated comparison of pituitary and gray matter volumes, it has been demonstrated that male individuals with pediatric abuse-related PTSD had greater volumes than their female peers (De Bellis, Keshavan, Frustaci, et al., 2002; Thomas & De Bellis, 2004). Finally, in line with this hypothesis, there is even additional evidence of the moderating role of sex in an animal study. Indeed, in a study on rodents conducted by Johnson and colleagues (2018), the behavioral effects of unpredicted postnatal stress have been found to impact more males than females, with males being more sensitive to stress-related social behaviors (Johnson et al., 2018). In short, all of these results advocate that very distinct neurological and biological pathways may exist in the human development of maltreated males and females with PTSD and that boys can be more susceptible to the adverse effects of stress on brain functioning in comparison to girls (De Bellis, Keshavan, Shifflett, et al., 2002).

In addition, the results of the present study are in line with the findings from previous research which have explored gender differences in social relationships of children who have been exposed to maltreatment. For example, a very recent study has considered the patterns of abuse disclosure to peers of boys and girls. Among other results, the researchers found that boys were more likely to feel like they had nobody to talk to about the maltreatment incident, while girls tended more to disclose and seek support from peers. Also, they advanced the hypothesis that maltreated boys and girls may use different coping strategies to manage the trauma of the abuse. Specifically, girls tend to seek social support and engage in exchanges with peers, whereas boys lean towards being more private and exhibit aggressive behaviors as a coping mechanism (Manay & Collin-Vézina, 2021). Finally, another study tested whether family conflict and victimization could predict poor social competencies scores in children. Again, as forecast, the authors concluded that the sex of the child was a significant predictor of social



competence. Particularly, maltreated boys were displaying fewer social abilities than girls (Hébert et al., 2006).

Several scholars have tried to advance argumentations to clarify why sex moderates the association between trauma symptoms and peer problems. Major contributions have come from psychiatry, psychology, neuroscience, and social work study-related areas. To sum up the main findings in this regard, the elucidations can be divided into two macro-areas, psychobiological and psychosocial.

Accounting for a psychobiological explanation, in their systematic review, White and Kaffman (2019) have advanced that the complex relationship between sex and childhood maltreatment could be influenced by a simple genetic vulnerability that is more marked in males than females (White & Kaffman, 2019). In line with this hypothesis, other studies have tried to advance possible interpretations of why sex can be a moderator of the relationship between trauma symptoms and peer problems (Andersen, 2015; Desantis et al., 2011). For instance, a study has reported that a reason why the corpus callosum of boys seems to be particularly vulnerable to the effects of maltreatment, as already individuated by De Bellis and Keshavan (2003), is that brain laterality appears to be significantly sex-differentiated especially when it comes to producing responses to emotional stimuli. Because of that, a reduced volume of the corpus callosum could exaggerate hemispheric specializations in boys, leading to noticeable sex differences in response to emotional stimuli (Desantis et al., 2011). Moreover, another study highlighted that boys show greater pruning and overproduction in many brain regions (when compared to girls), and this characteristic could explain why boys appear to be more vulnerable to environmental impacts, such as, among others, maltreatment incidents, as these experiences could influence male individuals' brain structure and physiology more than female individuals' (Andersen, 2015).

On the other hand, while accounting for a psychosocial explanation, it has been proposed that cultural norms about femininity, masculinity, and sexual orientation could also influence the moderation of sex on the social consequences of the abuse. For instance, it has been noted that it is more culturally desirable and acceptable for boys, rather than for girls, to act aggressively. This supposition could eventually lead to higher levels of peer problems in boys (White & Kaffman, 2019). Moreover, as highlighted by Crea and colleagues (2018), abused boys happen to experience more externalizing outcomes of maltreatment, such as, among others, antisocial behavior. An interpretation for that could be that boys tend to express negative

emotions through behavior, while girls tend to internalize them. This could represent a clear reflection of the heteronormative face of masculinity (Crea et al., 2018). In this regard, there is even evidence that cultural factors could be able to influence the learning acquisition of distinct patterns of emotional expression of girls and boys, such that maltreated boys living in countries where gender stereotypes are predominant could be at a higher risk for a direct link between abuse-derived traumatic symptoms and externalizing problems (Guerra et al., 2020).

The last contribution of the current study specifically regards PTSD intrusion symptoms. In the present study, the only set of PTSD symptoms which resulted as significant in the moderation model was intrusion symptoms. Intrusion symptoms usually include unwanted memories of the traumatic event and trauma-related episodes of reexperiencing, nightmares, and sleep disturbances. Although there are not studies investigating intrusion symptoms per se and their consequences on peer problems as moderated by child sex, some researchers have examined the impact of one of the manifestations of intrusion symptoms, i.e. sleep problems, on peer relationships (Hoedlmoser et al., 2010; Wiater et al., 2005). The claim of the current study confirms the findings of previous studies about sleep disorders and behavioral problems in which the authors determined that problems to sleep through the night and nightmares were linked to hyperactivity and conduct problems during the day and that those associations were much more prevalent for boys than for girls (Hoedlmoser et al., 2010; Wiater et al., 2005).

Finally, a very interesting study has established that genetic differences in PTSD are exclusively associated with intrusion symptoms, whereas they cannot account for other clusters of symptoms that are emblematic of PTSD, such as avoidance or negative modifications in mood (Rusch et al., 2019). Even though the researchers did not investigate further the role of sex in this regard, it could be advanced that intrusion symptoms, that is, criterion B, is the only PTSD criterion that predicts peer problems when moderated by the sex of the children precisely because of sex-related genetic differences. On this issue, future research is unquestionably needed.

#### **4.1 Limitations of the Study and Future Directions**

There are several limitations to this research that merit attention. Caregivers were the only ones who answered the questionnaires and provided information regarding trauma and peer problems

in children and adolescents. Moreover, it must be noted that most respondents were the mothers. This could have caused a reporting bias. Therefore, future research should incorporate a multi-informant approach, which includes parents, teachers, children, and CPS reports. Comparing self-reported and non-self-reported data could allow for new insights about the issues explored in this research. Furthermore, the severity and age of exposure to the events were not measured, and information regarding PTSD and peer problems was available at only a single point in time, limiting the interpretation of results. In the future, a longitudinal study could be designed so that it can be tested whether the moderation effect of child sex and the association between PTSD and peer problems hold over time. Indeed, it would be very interesting to know whether those results are maintained into adulthood.

Another limitation of this study is that the associations between PTSD, peer problems, and child sex were tested solely in a Portuguese maltreated young population. As the cultural dimension seems to have a role in those associations, as previously discussed, the results cannot be generalized elsewhere without accurate, cross-cultural replication studies. Particularly, it would be interesting to research more extensively social factors, such as cultural and gender norms, and explore how they are related to sex, trauma, and peer problems. Although cultural and social factors seem crucial, future studies should explore both social and biological mechanisms, explaining the associations between trauma, peer problems, and sex, while also considering the putative effects of individual factors (e.g., temperament, personality). Multilevel research would allow for a more in-depth exploration of the relationships between the variables under study.

Additionally, it must be noted that peer problems had been measured with five items only, representing a subscale of the SDQ (Goodman, 1997). Even though the scale is considered reliable and has been extensively used in psychological research, other measures and methodologies could be more accurate in detecting peer problems (e.g., sociometric techniques). Also, a comparison group of non-maltreated children (but potentially exposed to non-interpersonal trauma) was not included in this study. The presence of such a control group could have highlighted additional findings of the complex relationship between trauma and peer problems that are not necessarily linked to childhood maltreatment. More complex research projects could encompass mixed-method studies using both qualitative and quantitative methods, through semi-structured interviews and surveys.



## CHAPTER 5

# **Conclusion**

The current study has two main findings. Firstly, PTSD predicts peer problems among maltreated children and adolescents, and, secondly, child sex acts as a moderator in the relationship between PTSD intrusion symptoms and peer problems, with boys exhibiting a stronger association between PTSD intrusion symptoms and peer problems. These results provide a substantial contribution to the fields of developmental psychology as they stress the importance of addressing peer problems in interventions for children who have been exposed to maltreatment incidents, as well as highlight the relevant role of child sex in the association between trauma and peer problems so that sex specificities can be further inspected in future studies about PTSD and its behavioral outcomes.



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