

Testing the Cycle of Maltreatment Hypothesis: Meta-Analytic Evidence of the Intergenerational
Transmission of Child Maltreatment

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Abstract

It has long been claimed that “maltreatment begets maltreatment”, that is, a parent’s history of maltreatment increases the risk that their child will also suffer maltreatment. However, significant methodological concerns have been raised regarding evidence supporting this assertion, with some arguing that the association weakens in samples with higher methodological rigor. In the current study, the intergenerational transmission of maltreatment hypothesis is examined in 142 studies (149 samples; 227 918 dyads) that underwent a methodological quality review, as well as data extraction on a number of other potential moderator variables. Results reveal a modest association of intergenerational maltreatment ($k = 80$; $d = .45$, 95% CI: .37-.54). Support for the intergenerational transmission of specific maltreatment types was also observed (neglect: $k = 13$, $d = .24$, 95% CI: .11-.37; physical abuse: $k = 61$, $d = .41$, 95% CI: .33-.49; emotional abuse: $k = 18$, $d = .57$, 95% CI: .43-.71; sexual abuse: $k = 18$, $d = .39$, 95% CI: .24-.55). Methodological quality only emerged as a significant moderator of the intergenerational transmission of physical abuse, with a weakening of effect sizes as methodological rigor increased. Evidence from this meta-analysis confirms the cycle of maltreatment hypothesis, although effect sizes were modest. Future research should focus on deepening understanding of mechanisms of transmission, as well as identifying protective factors that can effectively break the cycle of maltreatment.

Keywords: Maltreatment; intergenerational; meta-analysis

Considerable research over the past half century has been devoted to understanding the determinants and long-term consequences of child maltreatment. Interest in this phenomenon was sparked by the ground-breaking work of Kempe, Silverman, Steele, Droegemueller, and Silver (1962) on the *battered child syndrome*, which inspired researchers and the medical community to recognize child maltreatment as a serious public health and social problem. Since their seminal publication, generations of researchers from a wide range of disciplines have attempted to investigate the extent of the problem, as well as its antecedent risks, social impact, and psychological outcomes, in order to mitigate its occurrence via preventive interventions. The burden of maltreatment for children, families, and society more broadly, is astounding. Per nonfatal child maltreatment victim in the United States, the average lifetime cost is estimated at \$210,012, and the total lifetime economic burden resulting from new cases of maltreatment in 2008 was estimated to be 124 billion dollars (Fang, Brown, Florence, & Mercy, 2012). This burden can be passed on from generation to generation; there is evidence that childhood maltreatment experiences increase the risk of maltreating parenting (Pears & Capaldi, 2001; Widom, Czaja, & DuMont, 2015). However, results of existing empirical studies are inconsistent and sometimes contradictory. Therefore, the current study presents a series of comprehensive meta-analyses on the intergenerational transmission of maltreatment in general, as well as specific maltreatment types.

Based on the results of an expert international panel convened to consult on child maltreatment prevention, the WHO (1999) offers the following definition: “Child abuse or maltreatment constitutes all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child’s health, survival, development or dignity in the context of a relationship of

responsibility, trust or power.” This broad definition encompasses a wide spectrum of behaviors, from severe acts of physical abuse to arguably more hidden forms of maltreatment such as emotional neglect. Given the wide range of parenting practices, cultural expectations, and differing views on what constitutes child maltreatment, the WHO’s definition is especially expedient as it offers a standard definitional tool with which to assess potentially abusive and neglectful behavior. In this paper, following the definition set out by the WHO, we use the term *child maltreatment* to reflect the wide range of abusive, neglectful, and/or harmful behaviors experienced by children¹.

Population-based surveys undertaken in different countries, along with national statistics compiled through reports to state and local child protective service agencies, reveal that the prevalence of child maltreatment is a global health problem of epidemic proportions. Specifically, several meta-analyses have reported on the worldwide prevalence of childhood maltreatment, with mean prevalence rates for sexual abuse reported to be 12.7% (Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011), 26.7% for emotional abuse (Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2012), 17.7% for physical abuse (Stoltenborgh, Bakermans-Kranenburg, van IJzendoorn, & Alink, 2013), and 16.3% and 18.4% for physical and emotional neglect, respectively (Stoltenborgh, Bakermans-Kranenburg, & van IJzendoorn, 2013).

The vast literature on child maltreatment unambiguously demonstrates its deleterious consequences. In a commissioned report by the U.S. National Research Council (1993), the Panel on Research on Child Abuse and Neglect identified four primary areas in which the

¹ We use the term *child abuse* in some instances only when the authors of studies we cite employ this term themselves.

consequences of childhood maltreatment are known to have devastating effects. Organized according to a developmental framework, these areas include: 1) medical and physiological consequences; 2) cognitive and intellectual consequences; 3) psychosocial consequences; and 4) behavioral consequences. Medical and physiological consequences can include head trauma, failure to thrive, growth deficiencies, obesity and other neuro-motor handicaps (Danese & Tan, 2014; Norman et al., 2012). Cognitive and intellectual consequences of childhood maltreatment can include reduced cognitive functioning, impaired language development, and other neurological dysfunctions (Harden, Buhler, & Parra, 2016; Pollak Seth et al., 2010). Maltreated children are at a greater risk for developmental delay, and the psychosocial consequences are numerous as well, including poorer social skills and increased risk for mental health problems (Vachon, Krueger, Rogosch, & Cicchetti, 2015). Lastly, the effects of childhood maltreatment on psychopathology have been extensively researched, with results showing that maltreated children exhibit higher rates of physical aggression, antisocial behavior, delinquency, problematic internalizing and externalizing behaviors, and other risky behaviors (Hughes et al., 2017; Norman et al., 2012; Vachon et al., 2015).

Theoretical models suggest that multiple factors and layered contexts can contribute to family and interpersonal violence in general, and child maltreatment in particular. A notion proposed decades ago by Garbarino and Gilliam (1980), “the premier developmental hypothesis in the field of abuse and neglect is the notion of intergenerational transmission, the idea that abusing parents were themselves abused as children and that neglect breeds neglect” (p. 111), remains today. The common assumption that *violence breeds violence* (Curtis, 1963) has been extensively discussed in the literature and posited as the “cycle of maltreatment” hypothesis

(Thornberry, Knight, & Lovegrove, 2012)². To date, the extensive body of literature on this phenomenon comprises two approaches from which to conceptualize the behaviors and risk factors for the cycle of maltreatment. One conceptual approach posits that maltreated children are likely to become abusive parents. This *victim-to-perpetrator* conceptual approach is analogous to the “cycle of violence” hypothesis put forth by Widom (1989) and is the most common paradigm evoked in discussions of the *direct* intergenerational transmission of maltreatment. Another related approach suggests that individuals who are victims of childhood maltreatment go on to have children of their own who are also likely to experience maltreatment, even though they may not be the perpetrators of that maltreatment themselves. This *victim-to-victim* conceptual approach highlights the *indirect* transmission of maltreatment and is supported by a body of literature that focuses on the transmission of maltreatment victimization experiences without distinguishing actual abusers from non-offending caregivers (Kim, Noll, Putnam, & Trickett, 2007). The transmission of sexual abuse, for example, may involve a parent who was sexually victimized as a child and subsequently becomes more likely to have a child who then experiences sexual abuse himself/herself, at the hands of someone other than the victimized parent. These two conceptual approaches, which are known to have common risk factors (e.g., poverty, substance use, mental health difficulties, adolescent parenthood, parenting stress), are often collectively examined under the umbrella hypothesis of “the intergenerational transmission of maltreatment” (Brown, Cohen, Johnson, & Salzinger, 1998; Dixon et al., 2005a; Shenk et al., 2017; Stith et al., 2009).

² Other associated terms include “cycle of violence”, the “intergenerational transmission of abuse” (Kaufman & Zigler, 1989), the “intergenerational transmission of maltreatment” or the “continuity of child maltreatment” (Dixon, Browne, & Hamilton-Giachritsis, 2005a).

A comprehensive meta-analysis of the empirical studies amassed to date, along with an assessment of study quality, and an investigation of whether study quality moderates the magnitude of the intergenerational transmission of maltreatment, broadly conceptualized, is needed to move the field forward into its next half century of research. Relatedly, we also examine homotypic or heterotypic transmission of maltreatment (Berzenski, Yates, & Egeland, 2014). Homotypic transmission refers to the perpetuation of specific types of child maltreatment experience. For example, is the child of an individual who was physically abused in childhood more likely to also experience physical abuse? Does neglect beget neglect? Heterotypic transmission examines whether being the victim of a specific type of maltreatment increases the likelihood of perpetuating other types of maltreatment experiences. For example, is a mother who was physically abused as a child more likely to have a child who experiences neglect? In such cases the child and mother are both victims of maltreatment, but of different forms (Berzenski et al., 2014). Importantly, Berzenski et al. (2014) have aptly argued that both types of continuity should be examined, to ensure that information about the form and/or function of these transmission methods can be garnered.

Methodological Considerations and Controversies

Although the bulk of research has generally found evidence in support of the intergenerational maltreatment hypothesis, the association is not ubiquitous, and the strength of this association varies across studies even with similar sample characteristics. For instance, a study by Appleyard, Berlin, Rosanbalm, and Dodge (2011) on 499 mother-child dyads from a small southeastern city in the United States found that maternal history of childhood physical abuse weakly predicted offspring victimization. In contrast, research by Simons, Whitbeck, Conger, and Wu (1991) on 451 parent-child dyads from Northern Iowa found a substantially

larger effect for the intergenerational transmission of physical abuse. Variations in effect sizes can be due to a number of methodological issues, as many researchers have suggested (Heller, Larrieu, D'Imperio, & Boris, 1999; Thornberry et al., 2012). Today, considerable controversy exists regarding the role of methodology in *supporting* or *refuting* the intergenerational transmission of maltreatment hypothesis. Decades ago, Garbarino and Gilliam (1980) noted that this intuitively appealing hypothesis has not “passed scientific muster” (p.111), an opinion that has been proliferated in the literature over time (Thornberry et al., 2012; Widom, 1989). Specifically, the validity of findings has been questioned due to several important methodological limitations and biases, including the use of poor operational definitions of maltreatment, retrospective recall, single informants for the assessment of maltreatment in different generations, and an absence of prospective studies.

One study worthy of mention that exemplifies exceptional methodological rigor in the field, is by Widom et al. (2015). They prospectively followed 902 children with documented cases of maltreatment having occurred between 1967-1971, with a matched comparison group ($N = 667$). These participants were followed prospectively for a period of approximately 40 years, and the child protective service agency records of these individuals and their children were searched during this time. Using a multi-informant, multi-method approach to assessing maltreatment, the authors found that approximately 21% of parents with documented histories of maltreatment perpetrated some form of maltreatment toward their own children, compared to 11.7% of matched comparisons (adjusted odds ratio: 2.01; 95% CI 1.42-2.85). They also found that parents with a history of maltreatment were approximately four times more likely than matched controls to have a child placed in the custody of the courts (4.8% vs 1.3%). However, the extent of intergenerational transmission varied as a function of the type of maltreatment

being perpetrated: a parent's history of sexual abuse was associated with a 2-fold increased risk of their child being sexually abused, a history of neglect was associated with a 2-fold increased risk of perpetuation of neglect, but a history of physical abuse was not associated with an increased risk of propagating physically abuse. Based on best quality methodology, the authors concluded that the strongest evidence for intergenerational transmission of maltreatment is for sexual abuse and neglect specifically, but not physical abuse.

Several methodological reviews of the intergenerational transmission hypothesis have been published. In a review of 20 studies, Kaufman and Zigler (1987) asserted that despite the widely accepted public and professional opinion that maltreated children become maltreating parents, there was a dearth of high quality empirical evidence supporting this notion. As a result, they critically reviewed all methods of testing this assumption to determine its scientific validity. They concluded that the "best estimate" of the rate of intergenerational transmission of maltreatment was approximately 30% ($\pm 5\%$), a rate five times the size of the base rate for maltreatment in the general population. However, they determined that many studies lacked methodological substantiation and rigor to support theoretical assumptions. The authors concluded that there is some evidence to support the notion that maltreatment is transmitted across generations. However, they also stated that unqualified acceptance of this hypothesis is not only unfounded, but misguided.

In a review of 10 studies on the intergenerational transmission of physical abuse in particular³ published between 1965-2000, Ertem, Leventhal, and Dobbs (2000) examined the

³ Although the literature on the intergenerational transmission of maltreatment is quite large, the comparatively smaller sample size in the Ertem et al. review was due to their stringent criteria for study inclusion (e.g., a comparison group was required) and an exclusive focus on physical abuse.

scientific validity by demarcating a set of eight methodological standards that would be expected in a hypothetical randomized controlled design, the most salient of which included: adequate definitional criteria and demographic comparability, avoidance of recall and detection bias via retrospective measurement, double-blind evaluators of parent and child history of physical abuse, and controls for potential intervening variables. The authors concluded that their criteria were poorly met: 80% of studies met fewer than five methodological standards. Based on this methodological inadequacy, the authors concluded that there was little robust evidence that a history of being physically abused leads to perpetuating physical abuse. They suggested that further investigation was needed in order to deepen knowledge and to derive concrete conclusions on the purported generational continuity of physical abuse.

Following the publication of Ertem et al.'s (2000) review, the notion that maltreatment begets maltreatment has continued to be debated in the scientific literature and public domain. Many methodologically rigorous studies on the topic were published, but debate on the validity of these studies has continued to be questioned. In 2012, Thornberry et al. provided an updated methodological review of the literature on the intergenerational transmission of maltreatment. They drew on the work of Ertem et al. (2000), but examined the broader category of maltreatment rather than limiting their analysis to physical abuse only, and elaborated on their review via an expanded set of 11 methodological standards (see Table 1). In total, 47 studies were scored using these methodological standards and no study met all 11 methodological criteria (mean score: 4.81; range: 2-10). Amongst the 7 studies considered to be of highest methodological quality, two found direct and one found indirect support (via mediated pathways) for the intergenerational maltreatment hypothesis, three found support for sexual and/or physical abuse transmission in particular, but not maltreatment more broadly, and one failed to find

support for the intergenerational transmission of maltreatment hypothesis. Of the 24 studies that were deemed to have only modest methodological quality, 20 had significant effect sizes. The authors concluded that although most studies found weak to modest support for the cycle of maltreatment hypothesis, evidence from their review suggests that in studies with more rigorous methodology, this support becomes tenuous.

The Current Study

All reviews to date have either provided a narrative review of the literature and/or its methodological approaches, or a methodological quality evaluation, and subsequent description of the number of studies (so called ‘vote-counting’) reporting statistically significant intergenerational transmission of maltreatment stratified by levels of pre-determined methodological validity (Ertem et al., 2000; Thornberry et al., 2012). While both approaches have merit in the field and have likely collectively spurred more methodologically rigorous research, there are limitations to drawing conclusions based purely on a count of the number of studies reporting statistical significance alone. The p -value is highly dependent on statistical power, and studies differing widely in their substantive findings may be treated inaccurately as yielding the same evidence. Further, such vote-counting does not allow for the estimation of the overall strength of the observed associations, the extent to which findings are consistent across studies or vary systematically from one another (i.e., between-study heterogeneity), the sources of such between-study variation, or the impact of publication bias. By combining studies via meta-analysis, the shortcomings of narrative and methodological quality reviews can be overcome by the calculation of an overall effect size estimate of the intergenerational transmission of maltreatment that corrects for biases that can accompany small sample sizes, addresses potential publication bias and can identify important study characteristics potentially

responsible for differing estimates of intergenerational association (Valentine, Pigott, & Rothstein, 2010). Examining whether study characteristics impact the strength of the observed association between maltreatment across generations is critically important in this context because it allows a clear test for the presence of upward bias associated with low quality studies.

In the current meta-analytic synthesis, Thornberry et al.'s (2012) methodological standards were used to examine methodological quality as a moderator in all studies meeting study inclusion. In addition, critical to adequately exploring the strength of the intergenerational maltreatment literature is an examination of differences that may arise as a result of how maltreatment measures are collected, and who is providing the information on the maltreatment experiences. These measurement factors go beyond what may be measured as methodological quality, as one method of collecting data is not necessarily deemed to be more rigorous in terms of methodological strength, but effect sizes may, nonetheless, vary by these measurement factors and thus they are worthy of examination.

Measurement factors. Studies that rely on self-report methodology typically use interviews and questionnaires. Other studies use case records, such as case reports of child protective service files or other official reports (i.e., hospital records). Each method of collecting information has its own set of strengths and weaknesses that could influence effect size estimates. Questionnaires and face-to-face interviews are based on retrospective recall of maltreatment experiences, which can lead to underreporting and may fail to adequately capture the chronicity and severity of maltreatment experience (Henry, Moffitt, Caspi, Langley, & Silva, 1994). Another method of data collection is through case reviews. A potential drawback of case reviews is that they are based on reported incidents and/or substantiated maltreatment cases that have fallen under the purview of child protective services, for example, which can underestimate

the true occurrence of maltreatment (Leventhal, 1998), and can also lead to detection bias (Widom & Wilson, 2015).

Studies examining the worldwide prevalence of various types of maltreatment experiences have found large between-study differences based on the type of measure and informant of maltreatment (Stoltenborgh et al., 2011), with informant reports resulting in much lower prevalence estimates than self-report. In the intergenerational transmission of maltreatment literature, some studies have noted that effect sizes may be more robust using case reviews (Bartlett, Kotake, Fauth, & Easterbrooks, 2017; Milaniak & Widom, 2015; Wekerle, Wall, Leung, & Trocmé, 2007), while others have not (Healy, Kennedy, & Sinclair, 1991; Tomison, 1994). Finally, some studies use mixed informants, such as self-report for the second generation (G2) maltreatment, and case reports for the third generation (G3). This mixed informant approach has been deemed by some to be more methodologically sound (e.g., Thornberry et al., 2012) as it also disentangles informant bias that can accompany parent-report of both G2 and G3 maltreatment. Taken together, it is crucial to determine if estimates of intergenerational transmission significantly vary according to the method of collecting maltreatment experiences (examined as type of measures and type of informant of maltreatment experiences).

In addition to testing for methodological quality and measurement factors, the current study also tests a set of moderators that may also affect the strength of the intergenerational association, including the role of poverty and family risk, child age and gender, as well as publication bias and dissemination medium.

Socio-Economic Status, Ethnicity, and Family Risk. Although child maltreatment cuts across all ethnicities and socio-economic strata (SES), the prevalence of maltreatment is higher in minority populations and/or in groups characterized as having low socio-economic status

(Hussey, Chang, & Kotch, 2006; Sedlak et al., 2010; Stith et al., 2009). SES can be conceptualized as a contextual indicator for other factors that may increase the risk of committing child maltreatment, such as parental psychopathology and early childbearing (Pears & Capaldi, 2001). These contextual indicators may impinge or interfere with educational and employment opportunities and lead to low SES or poverty, and the financial and contextual stressors typically associated with them (Miech, Caspi, Moffitt, Wright, & Silva, 1999). For example, early childbearing is associated with poor educational attainment, which in turn, limits employment opportunities (Assini-Meytin & Green, 2015; Taylor, 2009). The possibility that the intergenerational transmission of maltreatment varies according to SES is suggested by a number of studies that have reported that low SES families, as well as minority populations (Pelton, 2015), are exposed to greater social stressors, including financial strain, frequent moves, community violence and single parenthood, that place them at higher risk of child maltreatment (Alink, Euser, van IJzendoorn, & Bakermans-Kranenburg, 2013). In effect, a parent's own history of maltreatment, plus the additional strain of poverty and its correlates, can serve as a potent "double threat" that increases the risk of the perpetuation of child maltreatment (Hughes, Parkinson, & Vargo, 1989). As a result, in the current study we examine several factors related to family risk as potential moderators of the intergenerational transmission of maltreatment, including socio-economic status, minority populations, and maternal age.

Child Age and Gender. The definition of child maltreatment encompasses experiences endured from birth to 18 years (WHO, 2001). Maltreatment experiences are most likely to occur between birth to age 5 (DHHS, 2014), and are much less likely to occur after the age of 15 (Thornberry, Ireland, & Smith, 2001). This peak point of maltreatment occurs, at least in part, because children who endure maltreatment early in childhood are more likely to be removed

from the care of their biological parents (Ehrle & Geen, 2002). Child age, as it pertains to the intergenerational transmission of maltreatment is a relevant moderator, as studies examining this association within a short exposure time (e.g., when G3 is age 3), may substantially underestimate the prevalence of G3 maltreatment, and therefore, misrepresent the association of intergenerational transmission (Thornberry et al., 2012), whereas studies examining child maltreatment when children are older may have larger effect sizes due the possibly longer period of potential exposure. As a result, we examine whether child age explains between-study heterogeneity of effect sizes.

Child sexual abuse is asymmetric between boys and girls: the prevalence is 18.0% for girls, and 7.6% for boys (Stoltenborgh et al., 2012). In contrast, the prevalence rates of physical and emotional abuse, as well as neglect, are similar for boys and girls (Stoltenborgh et al., 2013a; Stoltenborgh et al., 2012b). Similarly, the only clear pattern of gender differences to have emerged in the intergenerational transmission literature is that the transmission of child sexual abuse is more likely for girls, than for boys (e.g., McCloskey & Bailey, 2000).

Publication Status, Sample Size and Study Year. Effect sizes can differ based on publication status and year of data collection. In comparison to unpublished studies (e.g., dissertations, book chapters), published studies undergo the rigors of the peer review process, which includes evaluation of the substantive contributions and methodological rigor of the research. However, such studies may also be biased in favor of larger effect sizes and statistical significance (e.g., Verhage et al., 2016). It is thus critical, where possible, to include data from both published and unpublished sources. Another important source of potential bias is the year of publication, as it is well known that early studies, often relying on weaker methods, tend to produce larger effect sizes (Ioannidis, 2005). In the field of maltreatment research, examination

of the intergenerational hypothesis was conducted in studies with small sample sizes, limited diversity, and no statistical controls, which can influence the magnitude of associations. More recent studies have tended to be methodologically more rigorous, involving large sample sizes, and accounting for potential study confounds. Thus, study sample size is also examined as a potential moderator of associations.

In sum, this study aimed to resolve discrepancies and debates in the field of child maltreatment by synthesizing the literature meta-analytically and identifying moderating variables that may amplify or attenuate associations of intergenerational maltreatment. To evaluate risk of methodological bias, we assessed the methodological quality of each study included in the meta-analysis based on predetermined methodological standards, and tested whether methodological quality at the individual-study level impacts the strength of intergenerational transmission. This is a critical endeavor, as an examination of mechanisms of intergenerational transmission has been hampered by a lack of resolution of this methodological controversy, and clear evidence regarding the status of this profoundly important question remains ambiguous.

Method

Definitional Criteria of Maltreatment

Definitional criteria for the constructs of the meta-analysis were guided by the international Consultation of Child Abuse Prevention (WHO, 1999)⁴. In this consultation,

⁴ In studies that did not explicitly label their maltreatment measure as “emotional abuse”, “physical abuse”, “sexual abuse” or “neglect”, an inference was made if the measure examined behaviors in line with the definitions above. If a study combined maltreating and non-maltreating behaviors in their measure of, for example, “emotional abuse” (e.g., displays of negative affect, expressions of anger, scolding, irritability, demandingness, immaturity, self-centeredness, poor discipline, etc.), it was excluded.

physical abuse was defined as “that which results in actual or potential physical harm from an interaction or lack of an interaction, which is reasonably within the control of a parent or person in a position of responsibility, power or trust” (p. 15). *Neglect* was defined as “the failure to provide for the development of the child in all spheres: health, education, emotional development, nutrition, shelter, and safe living conditions, in the context of resources reasonably available to the family or caretakers and causes or has a high probability of causing harm to the child’s health or physical, mental, spiritual, moral or social development. This includes the failure to properly supervise and protect children from harm as much as is feasible” (p.15). *Sexual abuse* was defined as “the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared and cannot give consent, or that violate the laws or social taboos of society” (p.15). *Emotional or psychological abuse* (henceforth referred to as emotional abuse), in particular, is defined as “the failure to provide a developmentally appropriate, supportive environment, including the availability of a primary attachment figure, so that the child can develop a stable and full range of emotional and social competencies commensurate with her or his personal potentials and in the context of the society in which the child dwells. There may also be acts towards the child that cause or have a high probability of causing harm to the child’s health or physical, mental, spiritual, moral or social development. These acts must be reasonably within the control of the parent or person in a relationship of responsibility, trust or power. Acts include restriction of movement, patterns of belittling, denigrating, scapegoating, threatening, scaring, discriminating, ridiculing or other non-physical forms of hostile or rejecting treatment.” (WHO, 1999, p. 15)

Search Strategy

Searches were conducted in MEDLINE, EMBASE, PsycINFO, Social Work Abstracts, Web of Science and the Cochrane Central Register of Controlled Trials in June 2015 and updated in April 2018. Both database subject heading fields (e.g., MeSH in MEDLINE, Emtree in Embase) and text word fields were searched for the concept of maltreatment (including physical, sexual, emotional, psychological, verbal, and neglect) (see Appendix A). Text word fields were searched to capture the concept of intergenerational maltreatment. Synonymous terms were combined with the Boolean “OR.” These two concepts of maltreatment and intergenerational abuse were combined with the Boolean “AND”. Age was searched through a combination of database limits, subject headings and text word searching. In all databases, truncation symbols and adjacency operators were used in text word searches when appropriate, to capture variations in spelling and phrasing. A second method of searching included the review of the reference lists of relevant reviews, articles, and book chapters. The database search yielded 2100 relevant non-duplicate records, and an additional 123 abstracts were manually searched via the review of reference lists, leading to a combined total of 2226 records (see Figure 1).

FIGURE 1 HERE

Inclusions and Exclusion Criteria

Studies were deemed to meet inclusion based on the following criteria: (1) included a measure of childhood maltreatment among the parental generation (G2 abused by their G1 parental figure). Forms of maltreatment included physical, sexual, emotional abuse, and/or neglect; (2) included an outcome measure of perpetration of child abuse among the G3 generation; (3) child maltreatment experienced by G2 and G3 occurred ≤ 18 years of age; (4) maltreatment was measured via self-report, interviews, official child protective services records

(CPS) or equivalent child authority records; (5) sufficient information was provided for the calculation of an effect size; and; (6) the study was written in English, French, or Spanish.

Exclusion criteria: (1) non-empirical publications, such as descriptive reports, case studies, or book and narrative reviews; (2) studies examining the association between witnessing inter-parental violence and violent behavior in adolescence/adulthood (Stith et al., 2000) or violence exposure/abuse victimization in childhood and risks for committing intimate partner violence in adulthood (Wilson, Stover, & Berkowitz, 2009); (3) studies on post-traumatic stress disorder from war, genocide, or other traumatic historical events and risk of perpetuating maltreatment; and (4) studies examining potential for, but not perpetration of, maltreatment (e.g., studies using the Child Abuse Potential Inventory; (Milner, 1986).

All records were reviewed by at least two graduate research assistants, and the full text article of any study deemed to potentially meet inclusion criteria was examined. Using the specified inclusion and exclusion criteria, 424 records met initial inclusion criteria and their full text articles were retrieved, and 1802 were excluded. Upon thorough review of 424 full text articles, a subsequent 282 studies did not meet our inclusion criteria (see Figure 1). Thus, the total number of studies included in the current meta-analysis was 142 studies with 149 samples, and the k for each maltreatment type was as follows: G2 maltreatment -> G3 maltreatment $k = 80$; G2 neglect -> G3 neglect $k = 13$; G2 physical abuse -> G3 physical abuse $k = 61$; G2 emotional abuse -> G3 emotional abuse $k = 18$; G2 sexual abuse -> G3 sexual abuse $k = 18$.

Data Extraction: Methodological Review

As detailed in Table 1, the same methodological criteria used in Thornberry et al.'s, (2012) review were used in the current study. Two of these criteria were slightly modified to account for the multi-generational component of the data structure: “prospective measure of

maltreatment” and “validated measure of maltreatment”. In Thornberry et al.’s review, each generation had to be scored as meeting that criterion to receive a score of 1. For example, if retrospective reports were used to measure maltreatment in one generation, but prospective reports were used to measure it in the other, this study would be coded as not fulfilling that criterion. This “all or none” method in Thornberry et al.’s coding approach penalizes studies that used prospective reporting in one generation and not the other. Similarly, if a study used a validated measure of maltreatment for one generation but not the other, this study would be penalized for not meeting the “validated measure of maltreatment” criterion, when in fact, this criterion was met in at least one generation. Because of this, we elected to score each generation separately for whether maltreatment was examined prospectively and whether it was assessed using a validated measure, resulting in a total of 13 criteria scored for each study (see Table 1).

TABLE 1 HERE

Studies were given a score of either 0 or 1 for each criterion (see online supplemental Table 1) and were summed to give a total possible score of 13. All studies were double coded and discrepancies were resolved through conferencing.

Data Extraction: Meta-Analysis

A team of three graduate research assistants, supervised by the first author reviewed the full text of all manuscripts meeting study inclusion criteria for the purpose of extracting relevant effect sizes and for coding sample and study-level moderator variables. As described in the following sections, a structured data extraction manual was developed by study authors to ensure accuracy and reliability of the coding process.

Section 1: Background Information

This section contains preliminary information describing studies that met inclusion criteria. Relevant data included: 1) year of publication to assess for potential changes in the magnitude of effect sizes over time, 2) publication source: i) unpublished, including theses/dissertations and reports or ii) peer-reviewed journal articles; 3) sample size used in analyses of intergenerational maltreatment.

Section 2a: Sample Characteristics

Similar to other large scale meta-analytic reviews (e.g., Lucas-Thompson, Goldberg, & Prause, 2010; Madigan, Brumariu, Villani, Atkinson, & Lyons-Ruth, 2016), for all sample characteristics, a cut-off point of 80% or higher was considered to represent the majority of the sample.

*Ethnic Composition*⁵. The percentage of each major ethnicity category was reported. For studies conducted in predominantly Caucasian majority settings, we inferred that the ethnicity was 100% White if no other ethnic representation was explicitly stated. The same reasoning was applied to studies that took place in other settings with a predominant ethnic majority (e.g., we inferred that the ethnicity was 100% Asian in studies conducted in Asia if no other information on ethnicity of the sample was provided). From these derived values, a percentage of minority ethnicities was tallied (i.e., the total percentage across all minority ethnicities that was non-Caucasian). If study authors indicated that they combined two or more ethnicities together, the percentage was documented under a “mixed” ethnicity category and tallied into the final score

⁵ If a study had missing data but referred to another publication in which information on study methods and sample characteristics was reported, this source was reviewed to attain relevant information.

for percentage minority. Minority status is specific to the country in which the study takes place (e.g., if the study was conducted in Japan, we did not count Asian participants as minority).

Study location. The regions in which studies were conducted were classified as follows: i) North America, ii) Europe, iii) South America, iv) Australia and New Zealand, v) Asia, or vi) Africa.

Demographic Risk. The presence versus absence of the following demographic risk factors was coded: low SES, single parenthood, adolescent parenthood, and high crime neighborhood. Subsequently, children's exposure to risk was coded dichotomously (i.e., 1 = one or more risks; 0 = no risk).

Child characteristics. This section included child gender and age: i) child gender was coded as percentage of females within the sample, and was entered as 50% female in cases where information on child gender was not provided; ii) child age, in months, at the time of the outcome measurement assessed.

Parental Characteristics. This section included parental gender and age: i) parental gender was coded as percentage of the sample that was female; ii) maternal age, in years, at the time of the outcome measurement assessed.

Section 3: Measurement Characteristics

Parental maltreatment type for G2 and G3: This variable refers to the type of maltreatment that the parental generation experienced, as well as the type of maltreatment that the child generation experienced. For both G2 and G3, studies were classified into one of the following maltreatment categories: i) physical abuse; ii) sexual abuse; iii) emotional abuse; iv) neglect; and v) multi-type maltreatment.

G2 and G3 maltreatment measures: The type of parental and child maltreatment measure was documented as follows: i) questionnaire; ii) interview; iii) official case reports (CPS reports, hospital records, offender records, court records, etc.); and iv) mixed methods.

Data extraction for all studies meeting inclusion criteria was conducted by a primary coder (AL), and double coded by at least one additional coder (CR, JP). All disagreements were resolved via discussion and consensus coding. Studies that presented challenging data extraction information were reviewed with the first author (SM), and subsequently discussed with the remaining data extraction team.

Computation of Effect Sizes. A variety of statistics were used to calculate effect sizes, with the majority of studies reporting odds ratios, chi-squares, means and standard deviations, *t*-values, or correlations. For a minority of studies, effect sizes could not be precisely estimated as the association was described as “non-significant” without the provision of a statistical value. When effect sizes were described as “non-significant” ($n = 7$) across all analyses), a *p*-value of .50 was assigned (Rosenthal, 1995).

Single and multiple measures of maltreatment. As maltreatment encompasses several types, multiple effect sizes from the same study based on the same sample of children were often presented for the association between G2 maltreatment and G3 maltreatment. As we were interested in the intergenerational transmission of maltreatment generally, as well as specifically by maltreatment types, effect sizes were computed as follows (see Figure 1 in the online supplemental materials): (1) if a study provided an effect size on the association between multiple types of maltreatment (“multi-type”) in G2 and perpetration of the same multi-type maltreatment in G3, this effect size was entered into the meta-analysis on maltreatment -> maltreatment; (2) if a study provided individual effect sizes for the association between two or

more types of maltreatment (e.g., sexual, physical, emotional abuse, or neglect) for G2 and G3, but not an overall maltreatment effect size, we combined these types of maltreatment to derive a single effect size representing the broader concept of “maltreatment” and entered this effect size into the analysis on maltreatment -> maltreatment. (3) Homotypic transmission: if a study reported on the transmission of a single type of maltreatment from G2 to G3 (e.g., physical abuse -> physical abuse), this effect size was included in the meta-analysis for that particular association; (4) heterotypic transmission: if a study reported on the transmission of a type of cross-over transmission of maltreatment from G2 to G3 (e.g., physical abuse -> neglect), this effect size was only included in the meta-analysis on heterotypic transmission.

Multiple effect sizes from the same study based on different subgroups or measures.

When different subgroups were presented, such as families from high versus low socio-demographic risk, each sample was entered separately into the meta-analysis. However, there were also instances for which results of subgroups could not be treated as independent effect sizes. Specifically, when effect sizes were presented for both mothers and fathers in G2 and G3’s incidence of maltreatment, these effect sizes could not be treated as independent effect sizes as data with G2 were overlapping. In such cases, we selected the association between G2 fathers and G3 children as data on G2 fathers were underrepresented in our meta-analysis. We adopted a similar practice for studies that provided multiple measures to examine G2 or G3 maltreatment, in which we selected the most underrepresented measures of maltreatment (i.e., CPS reports).

Data Analysis

Meta-Analytic Strategy. Effect size computations were conducted in Comprehensive Meta-Analysis 3.0 (CMA; Bornstein et al., 2014). Effect sizes were weighted according to the inverse of their variance to ensure that more precise estimates with larger effect sizes influenced

the overall effect size more heavily, and to attenuate for the upwardly biased estimates of smaller sample sizes (Hedges & Olkin, 1985). All analyses were performed using random effect models due to the variability in sampling methods and population parameters of studies included in the current meta-analysis. In addition, 95% confidence intervals around the mean effect size estimate were calculated. Heterogeneity of effect sizes were assessed using Q statistics (Borenstein et al., 2009). Categorical moderator analyses were examined using mixed effect models based on the Q statistic for heterogeneity. Consistent with previous meta-analyses (e.g., Bakermans-Kranenburg et al., 2003), for a category to be included in the test for significant differences amongst levels of the moderator, at least four or more studies were required. Meta-regression analyses were used to examine continuous moderators. Finally, to assess for publication bias, the trim and fill procedure by Duval and Tweedie (2000) was used, in which an inverted funnel plot is derived to demonstrate the association between sample size and effect size. If no publication bias is present, effect sizes are symmetrically represented around the combined effect sizes. If the funnel plot is asymmetric and fewer studies with weaker effect sizes are represented on the bottom left hand side of the mean effect size, the trim and fill procedure imputes symmetrical values to balance the funnel plot, and an adjusted mean effect size accounting for publication bias is provided.

Methodological Review. The purpose of the methodological review was twofold: (1) to assess each study for methodological quality; and (2) to determine if methodological quality moderates effect sizes. The methodological review, described in the earlier data-extraction section, yields a determination of whether a set of 13 pre-determined criteria are met (see Table 1), as well as a total methodological quality score. To satisfy the complimentary aims of this methods review, we approach data analysis in a number of ways to determine if methodological quality had an impact on effect sizes. We examined whether: (a) any of the 13 study quality

criteria moderated effect sizes; (b) the total methodological quality score moderated effect sizes; (c) studies grouped according to low (scores of ≤ 5), moderate (scores between 6-10), or high (scores of ≥ 11) methodological quality moderated effect sizes, and finally (d) consistent with the approach taken by Thornberry et al. (2010), we examined whether effect sizes varied as a function of study research design, classifying studies as: (i) case reports of maltreatment in G2 and G3 (e.g., Hospital Reports, Child Protective Services (CPS) reports); (ii) G2 self-report data on maltreatment history and G3 case reports of child maltreatment; and (iii) G2 and G3 self-report data of maltreatment. This collection of analyses was done only on data specific to the intergenerational transmission of *maltreatment*, due to insufficient studies per maltreatment type. In all other analyses on homotypic transmission, we only assessed whether the total methodological quality score is a moderator of effect sizes.

Results

Sample Characteristics

Sample characteristics for each study can be found in Appendix B. Sample size ranged from 25 to 85,084 (median $N = 222$). Overall, 94 (66.2%) studies were conducted in North America, 26 (18.3%) in Europe, 7 (4.9%) in South America, 7 (4.9%) in Australia and New Zealand, and 8 (5.6%) in non-Western countries (i.e., Africa and Asia). A total of 35 (23.5%) studies used some variant of the Conflict Tactics Scale (CTS; Straus, 1979), 18 (12.7%) studies used the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994), 59 (41.5%) studies utilized data from Child Protective Services or other official records, 30 (21.1%) used other various validated measures, and 72 used measures created for the purposes of the specific study (50.7%).

The mean age range for G2 was 19.2 to 57.0 years (mean age = 33.5 years) and on average, 72.4% were female. The age range for G3 was 5 months to 48.9 years (mean age = 9.4 years) and on average 51.6% of children were female. A total of 39 (26.2%) samples examined maltreatment of G3 perpetrated by the mother, 19 (12.8%) examined maltreatment of G3 perpetrated by the father, 44 (29.5%) examined maltreatment of G3 perpetrated by a non-specified parental figure, 8 (5.4%) examined maltreatment by any relative, and 34 (22.8%) did not specify the identity of the perpetrator.

Association between Parental Maltreatment History and Child Maltreatment

In 80 studies, the combined effect size was significant, $d = .45$ (95% CI: .37-.54), demonstrating a moderate association between parental history of maltreatment and maltreatment in the next generation. Fifty-seven studies (71%) had significant effect sizes, while 23 did not (29%). There was no indication of publication bias (see Figure 2). The Q statistic for heterogeneity of studies ($Q = 3339.43$, $p < .001$) was significant, and moderators related to study quality, and well as substantive and study-level moderators, were conducted to explain this variability.

FIGURE 2 HERE

Methodological Quality Moderators. The mean score of the methodological quality review was 7.35 (range 1-12). Moderator analyses revealed that the intergenerational transmission of maltreatment did not differ based on any of the study quality criteria (see Table 2). We also examined whether the total study quality score moderated effect sizes, and findings were not significant, suggesting that the magnitude of the transmission of maltreatment did not increase or decrease based on a continuous score of methodological study quality ($b = .006$; $p = .77$). In addition, when examined using a categorical score, the magnitude of transmission did not

vary as a function of whether studies were of low ($k = 15$; $d = .36$; 95% CI: .07-.22), moderate ($k = 53$; $d = .50$; 95% CI: .38-.62), or high ($k = 12$; $d = .38$; 95% CI: .26-.50) methodological quality. Finally, effect sizes did not vary as a function of when official reports of maltreatment were used in G2 and G3 ($k = 9$; $d = .31$; 95% CI: .14-.48), when studies had official reports of child maltreatment in G2 or G3 and self-report otherwise ($k = 23$; $d = .58$; 95% CI: .38-.78), or when self-report data of maltreatment was used in G2 and G3 ($k = 46$; $d = .41$; 95% CI: .32-.50).

TABLE 2-3 HERE

Substantive and Study-Level Moderators. All moderator analyses are reported in Tables 3 and 4. Although several moderators were tested, none emerged as significant.

Homotypic Continuity

In this section, we provide meta-analytic results of maltreatment-specific, type-to-type, transmission (e.g., neglect in G2 to neglect in G3).

Neglect. In 13 studies, the combined effect size was significant, $d = .24$ (95% CI: .11-.37), demonstrating a link between parental history of neglect and risk of one's own child experiencing neglect. The Duval and Tweedie procedure did not indicate publication bias. The Q statistic ($Q = 68.06$, $p < .001$) was significant, indicating heterogeneity of effect sizes, and moderator analyses were conducted to explain this variability (see Table 4); however, no significant moderators emerged including study methodological quality.

TABLE 4 HERE

Physical Abuse. In 61 studies, the combined effect size was significant, $d = .41$ (95% CI: .33-.49), demonstrating a link between parental history of physical abuse and risk of one's own child being physically abused. The Duval and Tweedie trim and fill procedure indicated asymmetry, suggesting that publication bias was present. Twenty-two studies were trimmed and

replaced, resulting in an adjusted significant effect size of $d = .24$ (CI: .16-.33). The Q statistic ($Q = 852.87, p < .001$) was significant, indicating heterogeneity of effect sizes, and moderator analyses were conducted to explain this variability (see Table 5).

TABLE 5 HERE

Total study quality score was a significant moderator: studies with higher methodological quality showed weaker transmission of physical abuse ($b = -.051; p < .05$). Analyses also revealed that dissemination medium was a significant moderator, with unpublished studies ($k = 5; d = .27; 95\% \text{ CI: .15-.39}$) having weaker effect sizes compared to published studies ($k = 56; d = .42; 95\% \text{ CI: .33-.50}$).

Emotional Abuse. In 18 studies the combined effect size was significant, $d = .57$ (95% CI: .43-.71), demonstrating a link between parental history of emotional abuse and one's own child enduring emotional abuse. No publication bias was detected. The Q statistic ($Q = 42.15; p < .001$) was significant, indicating heterogeneity of effect sizes, and moderator analyses were conducted to explain this variability (see Table 6). Several moderator variables were examined, but none emerged as significant, including study methodological quality.

TABLE 6 HERE

Sexual Abuse. In 18 studies, the combined effect size was significant, $d = .39$ (95% CI: .24-.55), demonstrating a link between parental history of sexual abuse and risk of one's child experiencing sexual abuse. A publication bias was indicated. Using the trim and fill procedure, 5 studies were required to create symmetry in the funnel plot, resulting in an adjusted observed effect size of $d = .22$ (CI: .05-.39). The Q statistic ($Q = 108.63, p < .0001$) was significant, indicating heterogeneity of effect sizes, and moderator analyses were conducted to explain this variability (see Table 7).

TABLE 7 HERE

Effect size varied as a function of the type of measure used to assess child sexual abuse. Effect sizes were stronger in studies using official records ($k = 7$; $d = .59$; 95% CI: .33-.85) compared to studies using questionnaire measures ($k = 6$; $d = .04$; 95% CI: -.11-.20). In addition, effect sizes strengthened as the percentage of females in samples increased ($b = .010$; $p < .01$), and as the percentage of mothers versus fathers in samples increased ($b = .005$; $p < .02$). Finally, effect sizes were stronger in studies from North America ($k = 11$; $d = .17$; 95% CI: .25-.57) versus Europe ($k = 5$; $d = .10$; 95% CI: -.04-.24). Study methodological quality did not moderate effect sizes.

Heterotypic Continuity

In this section, we examine if a parent's experience of certain types of maltreatment create a propensity for their own child being a victim of other types of maltreating behavior (e.g., physical abuse in G2 to emotional abuse in G3).

Parental Maltreatment Type: Neglect. The effect size for parental neglect to child physical abuse ($k = 15$) was significant, $d = .20$ (95% CI: .06-.33), suggesting a cross-over association in which parental history of neglect is linked to a greater chance that one's own child is physically abused. Significant cross-over was also observed for parental neglect to child sexual abuse ($k = 6$; $d = .25$; 95% CI: .04-.46). However, the effect size for the cross-over transmission from parental history of neglect to child emotional abuse was not significant ($k = 9$; $d = .15$; 95% CI: -.07-.37).

Parental Maltreatment Type: Physical Abuse. The effect size for parental physical abuse to child neglect ($k = 13$) was significant, $d = .30$ (95% CI: .20-.41). Effect sizes for the cross-over transmission of parental history of physical abuse to child emotional abuse ($k = 17$; $d = .40$; 95%

CI: .32-.47) and sexual abuse ($k = 9$; $d = .30$; 95% CI: .03-.56) were also significant. Taken together, these findings suggest that parental history of physical abuse is associated with all types of maltreating caregiving.

Parental Maltreatment Type: Emotional Abuse. The effect sizes for parental emotional abuse to child physical ($k = 13$; $d = .30$; 95% CI: .17-.43) and sexual abuse ($k = 7$; $d = .34$; 95% CI: .10-.57) were significant. However, effect sizes for the cross-over transmission of parental history of emotional abuse to child neglect was not significant ($k = 7$; $d = .17$; 95% CI: -.03-.37).

Parental Maltreatment Type: Sexual Abuse. The effect sizes for parental history of sexual abuse to child neglect ($k = 11$; $d = .34$; 95% CI: .17-.51), child physical abuse ($k = 21$; $d = .17$; 95% CI: .11-.23), and emotional abuse ($k = 11$; $d = .16$; 95% CI: .04-.27) were significant. Thus, parental history of sexual abuse is associated with all types of child maltreatment outcomes.

Comparing Homotypic and Heterotypic Intergenerational Maltreatment

Figure 3 provides a graphical illustration of all effect sizes for heterotypic and homotypic intergenerational transmission, for each type of maltreatment (e.g., G2 to G3 neglect is compared to G2 neglect to G3 physical, emotional, and sexual abuse). In addition to mean estimates of transmission, 85% confidence intervals around the mean are displayed. When the 85% confidence intervals overlap, we assume no statistically significant difference between groups (Julious, 2004). For neglect, all confidence intervals overlap, suggesting no differentiation in the magnitude of associations between homotypic (neglect G2 to neglect G3) and heterotypic (e.g., neglect G2 to physical abuse G3) transmission. A similar pattern of findings was present for physical abuse, emotional abuse, and sexual abuse, with no differentiation between homotypic and heterotypic transmission. In sum, the magnitude of effect sizes for homotypic and

heterotypic transmission were similar, suggesting that G2 experiencing one type of maltreatment places G3 at risk of experiencing several types of maltreatment.

FIGURE 3 HERE

Discussion

Child maltreatment represents a global major public health problem. Attaining a clear understanding of which pre-existing factors may place children at risk of maltreatment is of critical importance for prevention. A clear understanding of the extent to which a history of maltreatment in one generation raises the risk of maltreatment in the next could be vitally important for helping practitioners develop, and implement, targeted strategies to reduce rates of child maltreatment (Kim, Capaldi, Pears, Kerr, & Owen, 2009). Moreover, robust evidence from multiple high-quality studies can provide crucial evidence regarding the cycle of maltreatment hypothesis, which has been debated for many years by scholars. The results of our study reveal that compared to parents without maltreatment histories, parents who experienced child maltreatment are significantly more likely to have children who are also victims of maltreatment. We also found support for heterotypic and homotypic transmission of maltreatment types. For the most part, all effect sizes were small to moderate in magnitude (Cohen, 1992). There was little indication that study methodological quality moderated effect sizes. Perhaps most importantly, even in the highest quality studies effect sizes were statistically significant.

Methodological Quality and the Intergenerational Transmission of Maltreatment

It has been well documented that child maltreatment research is rife with methodological complexities (Berlin, Appleyard, & Dodge, 2011) and a number of authors have suggested that rigorous studies produce much smaller effect sizes, which may limit the importance of past maltreatment as a prognostic indicator of offspring risk. In order to comprehensively examine

whether variation in methodological quality resulted in a weakening (or strengthening) of the intergenerational transmission of maltreatment, we employed several empirical approaches, derived from traditional meta-analytic methods (e.g., assessment of categorical and continuous study quality indicators), as well as from previous narrative reviews that stratified studies based on research designs and assessed the strength of association of intergenerational transmission via each study's statistical significance (e.g., Thornberry et al., 2010). Results of the current meta-analysis revealed that, in general, the strength of the intergenerational transmission of maltreatment does not vary as a function of study methodological quality. Thus, this meta-analytic synthesis does not fully support the claim that the "cycle of maltreatment" hypothesis becomes less certain in studies with higher methodological rigor (e.g., Kaufman & Zigler, 1987; Thornberry et al., 2012). There was one exception to this finding however, study quality moderated the intergenerational transmission of *physical abuse*, with effect sizes weakening as study quality increased.

There are several possible explanations for the finding that methodological quality did not, for the most part, influence effect sizes. For decades, there has been a consistent plea in the literature to utilize strong research designs to derive firm conclusions regarding the magnitude of cross-generational association. It is possible that, more recently, there has been a domain-wide improvement in methodology. For example, in Thornberry et al.'s, (2012) review, the authors identified only one study that met the high standard criterion of assessing intergenerational maltreatment via child protective service records in both the parent and the child, whereas in the current meta-analysis, we found nine studies that met this criterion, and eight of these nine studies (89%) demonstrated significant intergenerational transmission of maltreatment.

Notably, in our review, no study scored perfectly on our methodological quality indicators. Key requirements for rigorous research designs include, at a minimum, obtaining reports of maltreatment from multiple sources or measures to enhance reliability of findings and to avoid cross-sectional retrospective recall of G2 and G3 maltreatment, observing a long follow up period of G3 maltreatment that ideally covers a considerable portion of the childhood years, using adequate controls in all statistical analyses, a gold standard practice in developmental science more broadly, and recruitment of participants in community samples to avoid selection bias. The most prudent methodological approach is to use multiple measures to assess maltreatment within any given generation, as well as across generations (Berlin et al., 2011; Widom & Wilson, 2015).

It is important to keep in mind that there is no single measure or method that can consistently and completely identify all maltreated and/or non-maltreated individuals. Some degree of error or “noise” is common in all scientific methods. Thus, estimates of maltreatment, and its correlation across generations, may continue to be over- and/or under-estimated, at least to some extent due to the prodigious measurement challenges inherent to work in this field. This may especially be the case for the intergenerational transmission of physical abuse, where methodological quality appears to be particularly relevant for understanding the magnitude of associations. This was demonstrated by the attenuation of effect sizes in higher quality studies, as well as in studies that were unpublished versus published. Thus, results from the current study are in line with conclusions from Ertem et al. (2000), who suggest that further investigation into the methodological complexities of the intergenerational transmission of *physical abuse* in particular are needed in order to derive concrete conclusions on the purported generational continuity of physical abuse. As there is no gold standard method for the identification of any

type of maltreatment, Widom et al. (2015) argue that future research should use a multi-measure or multi-informant approach to assess for maltreatment experiences, and likely physical abuse experiences in particular. Moreover, researchers should be aware that there are serious limitations to cross-sectional snapshots of parental and child maltreatment histories. Many studies designs start with a sample of parents and work backwards to inquire about their childhood maltreatment histories. As a result, these designs do not include individuals who were maltreated as children but did not go on to become parents, which may influence effect size estimates (Widom & Wilson, 2015). These should be important considerations in future research.

Other Moderators of the Intergenerational Transmission of Maltreatment

Several important moderators were identified in the current study for the intergenerational transmission of sexual abuse in particular. Transmission of sexual abuse was found to be highest when G3 measures of abuse were assessed via case reports (e.g., child protection service reports; $d = .59$) versus questionnaires ($d = .11$). This finding potentially suggests a degree of the caregiver under-reporting the child's history of sexual abuse in questionnaire measures. This may occur because the caregiver is unaware that sexual abuse is occurring or has transpired. Moreover, physical diagnostic evidence of child sexual abuse occurs in less than 5% of youth who receive a medical exam for suspicion of child sexual abuse (Smith, Raman, Madigan, Waldman, & Shouldice, 2018), and typically there are no witnesses to report the abuse. Thus, the caregiver's report and/or awareness of their child's sexual abuse history are typically contingent on the child disclosing abuse, which many children are reluctant to do (Hershkowitz, Lanes, & Lamb, 2007).

Child and parent gender explained between study heterogeneity in the generational continuity of child sexual abuse, with intergenerational transmission being stronger in studies

with more female children and female caregivers. These findings are not altogether surprising given the established asymmetry in child sexual abuse across genders, with the worldwide prevalence of child sexual abuse in girls being over twice that of boys (18% versus 7.6%; Stoltenborgh et al., 2011). There is also research suggesting that males are more reluctant to disclose sexual abuse due, at least in part, to gender-based socialization of men as aggressors versus victims, a lack of awareness that abuse has occurred, as well as concerns of being stigmatized and shamed (Coxell, King, Mezey, & Gordon, 1999; Lippert, Cross, Jones, & Walsh, 2009; Romano & De Luca, 2001).

Heterotypic versus homotypic continuity

In large part, both homotypic and heterotypic intergenerational transmission of maltreatment were observed and were small to moderate in magnitude. The findings of homotypic transmission suggest that a parent who has experienced a particular type of maltreatment, for example, physical abuse, is more likely to have a child who also experiences this type of abuse. The exception to the heterotypic finding was for the intergenerational transmission of neglect. Across the studies we reviewed, parents with a history of experiencing neglect (G2) were more likely to have children (G3) who also experienced neglect and physical abuse, but not emotional or sexual abuse. There was also no heterotypic transmission from G2 emotional abuse to G3 neglect. One explanation may lie in the definitional heterogeneity of neglect and emotional abuse which can be difficult concepts to operationalize due to the wide range of behaviors covered by the definition, cultural factors involved, and variability in how the construct is measured (see Mennen, Kim, Sang, & Trickett, 2010). For example, neglect has many different manifestations, including medical neglect, emotional neglect, physical neglect, and relates to acts of omission of care rather than acts of commission of inadequate care. In

addition, these forms of maltreatment, known as “hidden hurts”, may have fewer immediate tangible impacts compared to physical and sexual abuse, and as a result, they may be more likely to be underreported, which could influence the magnitude of intergenerational transmission.

In regards to heterotypic transmission, findings suggest that when a parent experiences a particular type of maltreatment, again with physical abuse as an example, his/her child is more likely to experience other forms of maltreatment as well, such as emotional abuse, sexual abuse, or neglect. When we compared the degree of homotypic and heterotypic transmission of maltreatment (see Figure 3), for neglect, physical abuse, emotional abuse and sexual abuse, the effect sizes were comparable and their 85% confidence intervals overlapped. That is, a parent’s history of physical abuse, neglect, or sexual abuse confers a similar risk for G3 experiencing physical abuse, as it does for G3 experiencing neglect, emotional abuse, and sexual abuse.

The finding of heterotypic transmission is consistent with research demonstrating that victims of child maltreatment are often exposed to multiple, co-occurring types of child maltreatment. For example, in a Canadian prevalence study, children exposed to multiple forms of maltreatment represented approximately 20% of all substantiated cases (Trocme, Knoke, & Blackstock, 2004). In a similar prevalence study from the Netherlands, approximately 40% of all substantiated cases of maltreatment reported involved more than one type of maltreatment (Euser et al., 2013).

The homotypic and heterotypic transmission of sexual abuse also merits particular attention. The “transmission” of sexual abuse is not analogous to the other transmission types, in that the parent who experiences sexual abuse is rarely the perpetrator of sexual abuse toward their own child. In fact, a common misperception is that victims of child sexual abuse will progress from victims to victimizers. While the victim-to-victimizer cycle of sexual abuse has been shown to occur to some extent in men, it is a rarity in women (Glasser et al., 2001). What

then, perpetuates the intergenerational transmission of sexual abuse? Undoubtedly, there are several factors at play. One postulation that has dominated the literature is that the intergenerational transmission of sexual abuse is a result of a parent failing to provide adequate protection and/or supervision to the child. For example, Fleming, Mullen, and Bammer (1997) found that children whose mothers had alcohol problems were at an increased risk of experiencing sexual assault, due at least in part, to lack of supervision while intoxicated. Having a parent with a mental illness has also been associated with an increased risk for experiencing sexual abuse (Felitti et al., 1998). Finkelhor, Hotelling, Lewis, and Smith (1990) have also suggested that children who receive inadequate care may seek out positive attention and affection from others, which creates vulnerability to victimization. Thus, a parent's inability to provide a supportive and protective environment, as well as their failure to recognize and appropriately assess cues of danger or threat, may perpetuate the cycle of sexual abuse.

Continuity and Discontinuity of Intergenerational Maltreatment

As noted by Kaufman and Zigler (1987), there are many negative consequences to being a victim of childhood maltreatment and one subsumed consequence is that victims of child maltreatment will themselves, become perpetrators of child maltreatment. However, it would be imprudent to assume that such individuals are unable to "break the cycle" of maltreatment. Indeed, in their review Kaufman and Zigler (1987) estimated that the majority (70%) of those maltreated as children did not become child perpetrators of maltreatment. Moreover, effect sizes for intergenerational transmission in the current series of meta-analyses were, albeit significant, small to moderate, indicating substantial non-transmission. Thus, being maltreated as a child puts an individual at risk of perpetuating maltreatment, but this association it is far from deterministic.

Instances of “lawful discontinuity” are equally important for understanding family processes and dynamics, and development more broadly (Belsky, 1993; Berzenski et al., 2014). A dual focus on continuity and discontinuity can provide insight into factors that persist or desist the likelihood of intergenerational transmission, which is key to understanding the mechanisms of transmission. For example, there is meta-analytic evidence that the presence of safe, stable, nurturing relationships is an important moderator in the transmission of maltreatment (Schofield, Lee, & Merrick, 2013). In general, maltreated individuals who report more emotional intimacy, relationship satisfaction, support, and warmth in relationships with parents, siblings, and intimate partners, are less likely to maltreat their own children compared to maltreated individuals who did not report having these safe, stable, nurturing relationships (Schofield et al., 2013). However, the ability to engage in these types of relationships is most likely not distributed randomly and may be influenced by the type and severity of the maltreatment. Future research could shed light on the factors that are independent of the experience of maltreatment and play a pivotal role in preventing intergenerational transmission.

One viable approach to further understanding who effectively breaks the cycle of maltreatment is through experimental manipulation. For example, randomized controlled (micro)trials could be implemented in which single possible factors that could break the cycle of maltreatment are systematically manipulated (e.g., by providing couple’s therapy or therapy focused on increased emotion understanding) to test whether these factors can indeed decrease the likelihood of passing maltreatment on to the next generation. Future research on continuity and discontinuity may also benefit from a broader approach that includes maintainers (continuity), cycle breakers (discontinuity) and activators (no abuse in G2 → abuse in G3) to further understand, predict, and identify targets for prevention (see St-Laurent et al., 2019).

Clinical Implications

Several clinical implications for the diverse array of professionals working with families emerge from this meta-analysis, both at the assessment and intervention levels. Considering the demonstrated transmission effects, this study suggests that assessments should include asking parents about their own histories of maltreatment to provide a clue into the potential risks posed to their own children. Again, the use of multiple sources of information is recommended to adequately assess past histories of maltreatment. It is important to point out again that not all individuals who maltreat their own children have maltreatment histories, and a fair number of parents who have been maltreated in their childhood do not go on to maltreat their own children. Thus, a broad examination of potential risks and protective factors is warranted. Moreover, in individuals who experienced maltreatment in their childhood, there is often a considerable desire to create measurable change in how they choose to parent their own children, although this parental capacity to change may not always be realized (Martsolf & Draucker, 2008; Swartz, Mercier, & Curran, 2012) or be easily assessed (Cyr & Alink, 2017).

It is important to implement assessment approaches that intentionally strengthen family capacities in order to assess potential resiliency factors. For example, to assess parental capacity to change in parents reported for child maltreatment, Cyr et al., implemented a strength-based, short-term attachment intervention (the AVI – Attachment Video-feedback Intervention of Moss et al., 2011), which was included in a parental capacity assessment protocol (PCA). They compared this protocol to either an assessment involving a psychoeducational intervention or to a treatment as usual PCA with no intervention. One-year post PCA, they found less recurrence of maltreatment in children of parents who were part of the AVI group and more likely to be

perceived by their PCA evaluators as capable of minimal standards of child care (Cyr, Paquette, Lopez, & Dubois-Comtois, 2015).

Maltreatment often occurs within the context of the parent-child relationship. Accordingly, several parenting intervention programs have been developed to enhance parental sensitivity and parent-child interactive quality with the aim of reducing the occurrence and transmission of maltreatment. For example, PCIT (Parent-Child Interaction Therapy), an evidence-based parent-training program grounded on principals of social learning and attachment theories, has demonstrated effectiveness in reducing the recurrence of child protection reports of physical abuse (Chaffin et al., 2004). While there are some studies that show demonstrated effectiveness in reducing child maltreatment, other randomized controlled trials in maltreating and at-risk families, as well as those at the general population, have not. Euser, Alink, Stoltenborgh, Bakermans-Kranenburg, and van IJzendoorn (2015) conducted a meta-analysis on the effectiveness of 20 intervention programs aiming to prevent maltreatment assessed using a randomized controlled trial. As the authors note, a rather gloomy picture emerges, in which only 5 out of 20 the intervention programs were effective in preventing or reducing the risk of child maltreatment. Moderator analyses revealed that treatment effectiveness was higher in studies that provided parent training and non-significant in studies that focused on support exclusively. This finding points to an important target of intervention, strength-based parent training, which at present, seems the most promising strategy to prevent child maltreatment.

Limitations and Future Directions

The current synthesis provides a quantitative examination of the intergenerational transmission of maltreatment and has as its strengths a dual focus on addressing the role of methodological quality, using a relatively large sample of studies from around the world. Despite

these strengths, there are also several noteworthy limitations that should be addressed. First, although we had a relatively large number of studies examining the intergenerational transmission of maltreatment ($k = 80$), the series of meta-analyses on homotypic transmission for emotional abuse, sexual abuse, and neglect were based on a small group of studies (k ranged from 13 to 18). One consequence of moderator analyses when the sample size is small is low statistical power, and therefore, the moderator analyses for emotional abuse, sexual abuse, and neglect should be considered exploratory.

Second, in the current study, maltreatment is treated as present versus absent and thus, does not take severity or chronicity into account. Extant theory suggests that the severity and chronicity of maltreatment experiences in G2 can play a role in the proclivity to be abusive towards G3. Specifically, a dose-response hypothesis has been proposed (Rutter, Quinton, & Little, 1983): the greater the dose of maltreatment in one generation, the higher the likelihood of transmission onto the next. Research supporting this claim, however, has been somewhat mixed. For example, Pears and Capaldi (2001) investigated the dose-response response hypothesis and found that parents who experienced severe physical punishment that resulted in injuries were more at risk of being abusive towards their own children than parents with less severe histories of physical abuse. Similarly, in a sample of 213 predominantly low-income African American mothers, Zuravin, McMillen, DePanfilis, and Risley-Curtiss (1996) observed an increased likelihood of intergenerational transmission of sexual abuse in women with more severe and chronic abuse exposure. However, they did not find a similar dose-response in the transmission of neglect or physical abuse. Consistent with this finding are studies by Caliso and Milner (1992), as well as Herrenkohl, Herrenkohl, and Toedter (1983) who failed to find support for the dose-response hypothesis. Future research is needed to disentangle these discrepant findings

across all maltreatment types, and to conclusively determine whether maltreatment severity places an additive risk on the probability of intergenerational transmission of maltreatment. The protective role of reduced severity should also be examined. Specifically, is the cycle of maltreatment more likely to be broken in those who had less severe and/or frequent maltreatment experiences?

A final limitation of the literature more generally is that research on the intergenerational transmission of maltreatment is correlational in nature, and thus, it cannot be inferred that maltreatment in one generation *causes* maltreatment in another. The current meta-analysis only confirms that an association is present. Moreover, this meta-analysis does not address potential mechanisms of transmission. For example, some researchers have suggested that intergenerational transmission associations may be partly, or entirely explained by other factors, such as genetic inheritance, traits shared between G2 and G3 or other third variables (Widom & Wilson, 2015). Devoted empirical searches for mechanisms of transmission, i.e., the “how” and the “why” of this developmental pathway, should represent the future of research on the intergenerational transmission of maltreatment, so that preventive interventions can be appropriately targeted.

Conclusions

The current study provides support for the cycle of maltreatment hypothesis, although effect sizes are small to moderate in magnitude. Parents with a maltreatment history are more than twice as likely to have children who also experience maltreatment. As Thornberry et al. (2012) aptly noted “if indeed there is clear and compelling evidence of intergenerational continuity, we then need to understand the mediating processes that link the generations in this regard” (p.146). Accordingly, it is recommended that the field refocus its attention to uncovering

and deepening understanding of mechanisms of intergenerational transmission and processes that are responsible for breaking the cycle of maltreatment. Knowledge about these mechanisms can directly inform and shape the development of future intervention and prevention strategies, which are urgently needed to break the cycle of maltreatment and ensure greater safety and enduring prosperity for the next generations of youth.

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Table 1

Study Quality Indicators

Description	Code
1. Sample that is representative of a general population or uses random sampling techniques.	0 = No 1 = Yes
2. Satisfactory participation or attrition rates.	0 = Unacceptable (participation less than 60% or attrition greater than 40%) 1 = Acceptable (participation greater than 60% or attrition under 40%)
3. Maltreated and non-maltreated individuals included in the primary sample.	0 = No 1 = Yes
4. Attempt was made to confirm the non-maltreatment status in the comparison group.	0 = No 1 = Yes
5. Controls for potential confounding factors or matching in studies comparing maltreated and non-maltreated groups.	0 = No 1 = Yes
6. Prospective measure of maltreatment (G2).	0 = Retrospective 1 = Prospective
7. Prospective measure of maltreatment (G3).	0 = Retrospective 1 = Prospective
8. Multiple reporters of maltreatment for each generation.	0 = Single (only one respondent reported abuse in both generations) 1 = Multiple (abuse records based on two official sources or both generations' self-reports, etc.)
9. Same follow-up/exposure period for maltreated and non-maltreated groups.	0 = No 1 = Yes
10. Follow-up/exposure period of an adequate timeframe.	0 = Low (children < 5 years old) 1 = Adequate (children \geq 5 years)
11. Valid measures used to assess maltreatment (G2).	0 = Not validated (i.e., the researchers made up a question to ask participants) 1 = Official (based on official documents, e.g., court records or CPS) or Validated (CTS, CTQ, etc.)
12. Valid measures used to assess maltreatment (G3).	0 = Not validated (i.e., the researchers made up a question to ask participants) 1 = Official (based on official documents, e.g., court records or CPS) or Validated (CTS, CTQ, etc.)
13. Maltreatment clearly defined beyond a description of the measures used in the study.	0 = Not clearly defined 1 = Clearly defined

Note: Study quality indicators adapted from Thornberry et al. (2012)

Table 2

Results for Moderators of the Study Quality Evaluation

<i>Categorical Moderators</i>	<i>k</i>	<i>d</i>	<i>95% CI</i>	<i>Q</i>	<i>P-value</i>
<i>Representative Sample</i>				0.56	.46
No	58	.43 ^{***}	.35-.51		
Yes	22	.50 ^{***}	.34-.65		
<i>Participation/attrition</i>				0.95	.33
Unacceptable	37	.40 ^{***}	.29-.52		
Acceptable	43	.49 ^{***}	.37-.61		
<i>Maltreated and non-maltreated participants included</i>					
No	7	.47 ^{***}	.20-.74	0.02	.90
Yes	73	.45 ^{***}	.36-.54		
<i>Confirmation of non- maltreatment status</i>				1.50	.22
No	34	.51 ^{***}	.36-.62		
Yes	46	.41 ^{***}	.33-.48		
<i>Use of Controls in Analyses</i>				0.46	.50
No	24	.41 ^{***}	.31-.51		
Yes	56	.46 ^{***}	.36-.56		
<i>G2 Prospective Data</i>				0.86	.36
No	79	.45 ^{***}	.37-.54		
Yes	1	.39 ^{***}	.27-.50		
<i>G3 Prospective Data</i>				0.05	.82
No	59	.44 ^{***}	.36-.53		
Yes	21	.47 ^{***}	.29-.64		
<i>Single/Multiple Informants</i>				0.46	.50
Single	29	.42 ^{***}	.31-.53		
Multiple	51	.47 ^{**}	.37-.58		
<i>Same Exposure Period for Maltreated and Non-Maltreated Groups</i>				0.85	.36
No	5	.58 ^{***}	.30-.87		
Yes	75	.44 ^{***}	.36-.53		
<i>Follow-up Exposure</i>				0.33	.57
Low (G3 < 5 yrs of age)	27	.41 ^{***}	.20-.61		

Adequate (G3 > 5 yrs of age)	53	.47***	.39-.55		
<i>G2 Valid Instrument</i>				0.52	.47
No	27	.41***	.29-.54		
Yes	53	.47***	.37-.57		
<i>G3 Valid Instrument</i>				1.56	.21
No	16	.37***	.22-.51		
Yes	64	.48***	.38-.57		
<i>Maltreatment Defined</i>				2.43	.12
No	45	.51***	.36-.66		
Yes	35	.37***	.28-.46		
<i>Study Quality^a</i>				2.66	.27
Low (score of ≤ 5)	15	.36***	.07-.22		
Moderate (score btw 6-9)	53	.50***	.38-.62		
High (score ≥ 10)	12	.38***	.26-.50		
<i>Research Design</i>				4.00	.14
Case reports in both G2 and G3	9	.31***	.14-.48		
Case reports in either G2 or G3	23	.58***	.38-.78		
Self-Report in both G2 and G3	46	.41***	.32-.50		

<i>Continuous Moderator</i>	<i>k</i>	<i>b</i>	<i>95%</i>		<i>Z-</i>	<i>P-value</i>
			<i>Lower</i>	<i>Upper</i>	<i>value</i>	
Study Quality Score	80	.007	-.037	.050	0.31	.76

** $p < .01$; *** $p < .001$

^a Minimum and maximum scores on the study quality index are 0 and 13, respectively.

Table 3

Results of Categorical and Continuous Moderators for the Associations between Parental History of Maltreatment and Child Maltreatment

<i>Categorical Moderators</i>	<i>k</i>	<i>d</i>	<i>95% CI</i>	<i>Q</i>	<i>p</i>
<i>G2 Measure</i>				3.16	.21
Case Reports	9	.31***	.14-.48		
Interview	16	.53***	.34-.73		
Questionnaire	52	.46***	.34-.57		
<i>G3 Measure</i>				3.06	.38
Case Reports	28	.48***	.32-.64		
Interview	4	.32	-.02-.66		
Mixed Methods	6	.51***	.44-.57		
Questionnaire	40	.41***	.31-.52		
<i>Demographic Risk</i>				2.85	.10
No	54	.48***	.37-.58		
Yes	26	.36***	.28-.45		
<i>Dissemination Medium</i>				3.34	.07
Unpublished	9	.60***	.44-.76		
Publication	71	.43***	.34-.52		
<i>Country of Origin</i>				0.08	.78
Europe	18	.49***	.23-.74		
North America	53	.45***	.37-.54		
<i>Continuous Moderators</i>	<i>k</i>	<i>b</i>	<i>95% Lower Upper</i>	<i>Z-value</i>	<i>p</i>
Child age	72	.000	-.001 .001	0.36	.71
Mother age	59	.002	-.009 .012	0.32	.75
Child gender (% female)	80	.001	-.005 .007	0.34	.74
Parent gender (% female)	80	.000	-.002 .002	0.03	.98
Ethnicity (% minority)	70	-.002	-.004 -.000	-1.72	.09
Year of publication	80	-.006	-.013 .002	-1.57	.11
Sample size	80	.000	-.000 .000	0.40	.78

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

Table 4

Results of Categorical and Continuous Moderators for the Associations between Parental History of Neglect and Child Neglect

<i>Categorical Moderators</i>	<i>k^a</i>	<i>d</i>	<i>95% CI</i>	<i>Q</i>	<i>p</i>
<i>G2 Measure</i>				0.26	.61
Case Reports	4	.32***	.22-.41		
Questionnaire	8	.26**	.08-.45		
<i>G3 Measure</i>				1.89	.17
Case Reports	5	.28**	.20-.35		
Questionnaire	5	.15	-.02-.32		
<i>Demographic Risk</i>					
No	8	.28***	.09-.48	0.59	.44
Yes	5	.20	.11-.29		

<i>Continuous Moderator</i>	<i>k</i>	<i>b</i>	<i>95% Lower Upper</i>	<i>Z-value</i>	<i>p</i>
Child age	13	-.000	-.001 .001	-0.20	.84
Mother age	8	-.008	-.024 .008	-0.96	.34
Child gender (% female)	13	.006	-.034 .050	0.26	.80
Parent gender (% female)	13	-.002	-.005 .002	-0.81	.42
Ethnicity (% minority)	12	.002	-.002 .006	1.09	.29
Year of publication	13	-.003	-.014 .020	0.32	.75
Study sample size	13	.000	-.000 .000	1.85	.07
Study quality	13	-.001	-.071 .069	-0.02	.98

Note. ^a Only moderators that had a sufficient number of studies (≥ 4) at each level of the moderator variable were reported.

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

Table 5

Results of Categorical and Continuous Moderators for the Associations between Parental History of Physical Abuse and Child Physical Abuse

<i>Categorical Moderators</i>	<i>k^a</i>	<i>d</i>	<i>95% CI</i>		<i>Q</i>	<i>p</i>
<i>G2 Measure</i>					2.94	.09
Interview	14	.31 ^{***}	.18-.44			
Questionnaire	46	.45 ^{***}	.35-.54			
<i>G3 Measure</i>					3.64	.16
Case reports	9	.26 ^{***}	.12-.40			
Interview	8	.35 ^{***}	.15-.54			
Questionnaire	40	.42 ^{***}	.33-.51			
<i>Demographic Risk</i>					1.33	.25
No	47	.42 ^{***}	.33-.52			
Yes	14	.34 ^{***}	.23-.45			
<i>Dissemination Medium</i>					3.91	.05
Unpublished	5	.27 ^{***}	.15-.39			
Publication	56	.42 ^{***}	.33-.50			
<i>Country of Origin</i>					2.50	.48
Australia	5	.42 ^{**}	.19-.66			
Asia	5	.40 ^{**}	.17-.63			
Europe	16	.52 ^{***}	.35-.70			
North America	31	.36 ^{**}	.27-.46			
<i>Continuous Moderators</i>	<i>k</i>	<i>b</i>	<i>95% Lower Upper</i>		<i>Z-value</i>	<i>p</i>
Child Age	48	-.000	-.001	.001	-0.62	.54
Mother Age	43	-.006	-.018	.006	-0.98	.32
Child Gender (% female)	61	-.002	-.008	.005	-0.50	.62
Parent Gender (% female)	61	-.001	-.002	.001	-0.69	.49
Ethnicity (% minority)	54	-.002	-.004	.001	-1.31	.19
Year of Publication	61	-.004	-.012	.005	-0.87	.38
Study sample size	61	-.000	-.000	.000	-0.61	.54
Study quality	61	-.051	-.094	.009	-2.39	.02

Note. ^aOnly moderators that had a sufficient number of studies (≥ 4) at each level of the moderator variable were reported.

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

Table 6

Results of Categorical and Continuous Moderators for the Associations between Parental History of Emotional Abuse and Child Emotional Abuse

<i>Categorical Moderators</i>	<i>k^a</i>	<i>d</i>	<i>95% CI</i>	<i>Q</i>	<i>p</i>
<i>Dissemination Medium</i>				0.10	.75
Unpublished	5	.64**	.20-1.08		
Publication	13	.56***	.42-.71		
<i>Country of Origin</i>				1.45	.23
Europe	8	.46***	.21-.71		
North America	6	.71***	.39-1.02		
<i>Continuous Moderators</i>	<i>k</i>	<i>b</i>	<i>95% Lower Upper</i>	<i>Z-value</i>	<i>p</i>
Child age	16	-.001	-.002 .000	-1.30	.20
Mother age	9	.002	-.030 .033	0.11	.92
Child gender (% female)	17	-.006	-.042 .054	-0.24	.81
Parent gender (% female)	18	.001	-.003 .005	0.54	.59
Ethnicity (% minority)	15	.005	-.005 .014	0.94	.34
Year of publication	18	-.006	-.022 .010	-0.71	.48
Study sample size	18	.000	-.000 .000	0.44	.66
Study quality score	18	-.031	-.138 .076	-0.57	.57

Note. ^aOnly moderators that had a sufficient number of studies (≥ 4) at each level of the moderator variable were reported.

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

Table 7

Results of Categorical and Continuous Moderators for the Associations between Parental History of Sexual Abuse and Child Sexual Abuse

<i>Categorical Moderators</i>	<i>k^a</i>	<i>d</i>	<i>95% CI</i>		<i>Q</i>	<i>p</i>
<i>G2 Measure</i>					0.64	.42
Interview	4	.47**	.18-.77			
Questionnaire	11	.32**	.10-.55			
<i>G3 Measure</i>					12.46	.001
Case reports	7	.59***	.33-.85			
Questionnaire	6	.04	-.11-.20			
<i>Country of Origin</i>					5.95	.02
Europe	5	.10	-.04-.24			
North America	8	.46***	.21-.70			
<i>Continuous Moderators</i>	<i>k</i>	<i>b</i>	<i>95% Lower Upper</i>		<i>Z-value</i>	<i>p</i>
Child age	15	-.002	-.003	-.001	-1.84	.07
Mother age	7	-.001	-.023	.022	-0.06	.96
Child gender (% female)	18	.010	.003	.016	3.00	.01
Parent gender (% female)	18	.005	.001	.010	2.39	.02
Ethnicity (% minority)	15	.007	-.002	.015	1.48	.14
Year of publication	18	-.002	-.022	.018	-0.18	.86
Study sample size	18	-.000	-.000	.000	-0.92	.36
Study quality score	18	.021	-.065	.11	0.47	.64

Note. ^aOnly moderators that had a sufficient number of studies (≥ 4) at each level of the moderator variable were reported.

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

Appendix A

Database: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations,
Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>

Search Strategy:

- 1 child abuse/ or child abuse, sexual/ (27662)
- 2 incest/ (1615)
- 3 Rape/ (5976)
- 4 Shaken Baby Syndrome/ (514)
- 5 Child, Abandoned/ (502)
- 6 ((child* or physical or sex* or emotional or verbal or psychological) adj6 (violen* or abus* or maltreat* or mistreat*)).mp. (54633)
- 7 (incest* or rape*).mp. (15341)
- 8 (neglect* or trauma*).mp. (419064)
- 9 or/1-8 (470986)
- 10 (intergeneration* adj10 (abus* or trauma* or maltreat* or mistreat* or violen* or transmission*)).mp. (1276)
- 11 (transgeneration* adj10 (abus* or trauma* or maltreat* or mistreat* or violen* or transmission*)).mp. (321)
- 12 ((cycle* or cyclical) adj6 (abus* or trauma* or maltreat* or mistreat* or violen*)).mp. (649)
- 13 (generation* adj10 (abus* or trauma* or maltreat* or mistreat* or violen* or transmission*)).mp. (3320)
- 14 or/10-13 (5263)
- 15 9 and 14 (1442)
- 16 limit 15 to "all child (0 to 18 years)" (649)
- 17 (infan* or newborn* or new-born* or neonat* or baby or babies or child* or youth or kid or kids or toddler* or boy* or girl* or adolescen* or teen* or juvenile* or pediatric*).mp. (3993491)
- 18 9 and 14 and 17 (957)
- 19 16 or 18 (957)

Appendix B

Study Characteristics for All Studies Included in the Meta-Analysis

Article	N	Age ^a (G2)	Maltreatment Measures		Maltreatment Type	
			G2	G3	G2	G3
Abolfotouh (2009)	153	10.77	NV-I	NV-I	PH	PH
Adamson (1997)						
G2 Males	89	48.90	PCCTS*	PCCTS*	MT	MT
G2 Females	161	47.30	PCCTS*	PCCTS*	MT	MT
Altemeier (1982)	1400	2.88	NV-I	CPS ⁺	N	PH
Appleyard (2011)	499	2.17	PCCTS*	CPS ⁺	PH, SX, N	MT
Avery (2002)	425	7.90	NV-Q	CPS ⁺	SX	SX
Bailey (2007)	363	11.90	NV-I	NV-I	SX	SX
Baldwin (1975)	51	0.42	NV-CR	CPS ⁺	MT	MT
Ball (2009)	414	-	CTS*	CTS*	PH	PH
Banyard (1997)	430	-	NV-Q	PCCTS*	PH, SX, N	PH
Banyard (2003)	152	11.95	CTS*, HR ⁺	CTS*/CPS ⁺	PH, SX	PH, N, MT EMP, SX,
Barrett (2009)	477	9.47	NV-I	PCCTS*	PH, N	MT
Bartlett (2017)	471	4.80	CPS ⁺	CPS ⁺	MT, N	MT, N
Beckerman (2017)	53	3.70	CTQ*	PS*/CTS*	MT	MT
Ben-David (2015)	6935	5.50	CPS ⁺	CPS ⁺	MT, N EMP, PH,	MT
Bert (2009)	681	0.50	CTQ*	PSEQ*	SX	MT
Bosquet Enlow (2016)	179	4.71	NV-I	CPS ⁺ , OBS	MT	MT
Brodsky (2008)	507	22.80	CEQ*	CARE*	PH, SX	PH, SX
Caykoylu (2011)	1202	-	NV-I	NV-I	PH	PH
Choi (2018)	1016	12.00	CTQ*	CTQ*	MT	MT
Cicchetti (2006)	189	1.11	CTQ*	CPS ⁺	SX	MT
Clément (2005)	929	7.33	NV-I	PCCTS*	MT	PH
Cohen (2008)	176	12.00	LEC*	PCCTS*	PH, SX	PH, EMP
Cole (1992)	59	9.00	NV-I	PDI*	SX	PH, EMP
Coohey (1997)	229	-	CTS*	CPS ⁺	PH	PH
Cort (2011)	104	11.00	CTQ*	CPS ⁺	MT	MT
Covell (1995)	32	4.00	NV-Q	NV-Q	PH, N	PH, EMP
Crombach (2015)	173	-	NV-I	NV-I	MT	MT
DeBruyn (1992)	190	8.72	NV-I	HP ⁺ ; NV-I	MT	MT
Dias (2014)						
War	91	33.00	CTQ*	CTQ*	ALL	ALL

War and PTSD	56	33.00	CTQ*	CTQ*	ALL	ALL
No War	41	33.00	CTQ*	CTQ*	ALL	ALL
Dietz (2000)	956	8.32	NV-I	PCCTS*	PH	PH
DiLillo (2000)	290	3.19	NV-I	NV-I	SX	PH
Disbrow (1977)	83	-	NV-I	CPS ⁺ , OBS	MT	PH, N, MT
Dixon (2005)	4351	1.08	NV-I	CPS ⁺ , OBS	MT	MT
Dubowitz (1987)	115	-	NV-I	HR	PA	MT
Dubowitz (2001)	244	4.88	NV-Q	CTS*	MT	MT
Duckworth (1997)						
Females	64	-	CTS*, PSY*	V-PARQ, CTS*	PH, EMP	PH, EMP
Males	19	-	CTS*, PSY*	V-PARQ, CTS*	PH, EMP	PH, EMP
Duhamel (2009)	41	9.00	AEIII*	PCCTS*	PH	PH
Dworsky (2015)	1938	1.20	CPS ⁺	CPS ⁺	PH, SX, N	MT
Egeland (1996)	244	4.25	NV-I	OBS	MT	MT
Esaki (2008)	477	8.00	LONGSCAN *	CPS ⁺	MT PH, N,	MT
Éthier (1995)	80	4.55	NV-I	CPS ⁺	EMP	N
Falbo (2004)	190	-	NV-I	NV-I	MT	PH
Ferrari (2002)	150	-	CTQ*	CTS*	MT	PH, EMP
Finkelhor (1997)	998	8.27	NV-I	NV-I	SX	SX
Folsom (2003)	436	5.55	NV-I, CR ⁺	CPS ⁺	MT	MT
Francis (2008)	49	6.00	CTQ*	CPS ⁺	MT	PA PH, N,
Fujiwara (2010)	304	7.80	CTQ*	NV-Q	ALL	EMP
Fuller (2003)	306	7.00	CTS*	CTS*	PH	MT
Gage (2010)	7724	8.50	NV-Q	NV-Q	PH	PH
Glasser (2001)	747		CR ⁺	CR ⁺	SX	SX
Goodwin (1981)	591	8.50	SSQ*, NV-I	CPS ⁺ , NV-I	SX	MT
Grusec (1991)	32	4.00	NV-I	NV-I	PH, EMP	PH, EMP
Haapasalo (1999)						
CPS- involved	25	12.68	NV-I	CR ⁺ , NV-I	PH, EMP	PH, EMP
CPS not involved	25	11.88	NV-I	CR ⁺ , NV-I	PH, EMP	PH, EMP
Healy (1991)	27	-	CR ⁺	CPS ⁺	PH, SX	PH
Hemenway (1994)	309	-	NV-I	NV-I	EMP, MT	EMP, MT
Herrenkohl (1983)	529	-	NV-I	NV-I	PH	PH
Herrenkohl (2013)	268	1.83	NV-I	NV-I	PH	PH
Heyman (2002)	1244	-	CTS*	CTS*	PH	PH
Hunter (1979)	259	0.77	NV-I	CPS ⁺	MT	MT

Isumi (2016)	4297	0.42	ACES*	NV-Q	PH, N, EMP	PH
Jackson (1999)	1000	8.40	PCCTS*	NV-I	PH, SX	PH, EMP
Jaffee (2013)	1116	9.50	CTQ*	OBS, NV-I	MT	PH
Jamal (2011)	200	9.10	NV-I	PCCTS*	PH ALL exc.	PH, EMP ALL exc.
Joo (2008)	130	9.62	EPAB*	NV-Q	SX PH, SX, EMP	SX
Kim, K. (2007)	120	11.00	MDHQ*	CPS ⁺	SX, MT	SX
Kim, K. (2010)	127	11.10	MDHQ*	CPS ⁺	PH, N	SX, MT
Kim, J. (2009)	2977	1.50	NV-I	NV-I	PH	PH, N
Kim, J. (2017)	2875	9.00	NV-I	NV-I	MT	PH
Kim, H. (2010)	488	2.00	CTS*	PCCTS*	MT	MT
Kotelchuk (1982)	402	2.00	NV-Q	HR ⁺	PH	MT
Kovan (2009)	26	2.00	OBS	OBS	EMP	EMP
Leifer (2004)	199	7.00	NV-I	CPS ⁺	MT	SX
Lesnik-Oberstein (1995)	172	1.90	NV-Q	CR ⁺	MT	EMP
Libby (2008)						
Southwest ern	1049	-	NV-I	NV-I	PH, SX	N
Northern	1172	-	NV-I	NV-I	PH, SX	N
Lukek (2015)	25	9.60	NV-Q	NV-Q	PH, EMP	PH, EMP
Macias (2004)	63	7.50	PSI*	TSCE*	MT	MT
Maida (2005)	89	7.00	NV-Q	CR ⁺	SX	MT, SX
Massé (1994)	209	6.00	NV-I	CPS ⁺	MT, SX	MT N, MT, EMP
Matos (2014)	277	7.30	NV-Q	CPS ⁺	MT	
McCloskey (2000)	171	9.00	SES*	CR ⁺ , NV-I	SX PH, MT,	SX
Medley (2009)	4141	-	NCS*	NV-I	SX	PH
Milaniak (2015)	1196	2.00	OR ⁺	CPS ⁺	MT	MT
Militza (2010)	1375	14.50	NV-I	NV-I	PH, N	PH, N
Miller (1999)	165	9.90	CTS*, NV-I	CTS*	PH, SX SX, PH,	PH, EMP
Miller (2000)	504	-	API*	API*	MT	MT
Mirabella-Beck (1999)	222	0.82	NV-Q	CTS/API/CPS ⁺	MT	PH, MT, EMP
Muller (1995)	732	18.00	CTS*	CTS*	PH	PH
Murphy-Cowan (1999)	371	5.41	NV-Q	NV-Q	PH, EMP	PH
Narayan (2017)	92	5.86	ACES*	ACES*	MT	MT
Newcomb (2001)	100	-	CTQ*	PARQ*	MT, SX, N ALL exc.	MT ALL exc.
Ney (1988)	65	8.50	PBI*	CA, NV-Q	MT	MT
Noll (2009)						

G1 to G2	128	11.11	CPS ⁺ , NV-I	CPS ⁺ , NV-I	SX	SX
G2 to G3	135	4.16	CPS ⁺	CPS ⁺	SX	MT
Oates (1998)	132	-	PBI*	CR ⁺	SX	SX
					ALL exc.	ALL exc.
Özcan (2016)	126	22.05	CTQ*	CTQ*	N	N
Pears (2001)	109	20.75	AEIII*	AEIII*	PH	PH
Peltonen (2014)	2716	6.00	NV-Q	CTS*	PH	PH
Perepletchikova (2012)	99	-	CTQ*	CPS ⁺	ALL	MT
Pérez (2003)	142	19.00	CHQ*	CHQ*	MT	MT
Plant (2013)	114	11.00	OBS; NV-I	CA ⁺	MT	MT
Putnam-Hornstein (2015)	8508 4	2.50	CPS ⁺	CPS ⁺	MT	MT
Ramírez (2011)	1089	8.50	NV-I	NV-I	MT	MT, SX
Renner (2006)	1005	7.40	NV-I	CPS ⁺	PH, SX, N	PH, MT, N
					EMP, PH,	EMP. PH,
Rikić (2017)	118	5.00	CAQ*	CAQ*	MT	MT
Rijlaarsdam (2014)	3212 1140	3.05	CTQ*	PCCTS*	MT	MT, EMP
						PH, MT,
Roberts (2015)	2	24.00	CTQ*	CTQ*	MT	SX
Rodriguez (1999)	99	-	NV-Q	NV-SR	PH	PH
Romero (2005)	300	10.00	CTS*	CTS*	MT	PH, EMP
Sahin (2011)	275	-	NV-I	NV-I	PH	PH
Saile (2014)	283	9.01	PCCTS*	PCCTS*	MT	MT
Salzinger (1992)	191	10.20	NV-I, CPS ⁺	CR ⁺ , NV-I	PH	PH
Scaramella (2003)	75	2.40	OBS	OBS	MT	MT
Schluter (2011)	742	1.50	EASEPI*	PBC*	PH	PH
Seay (2016)	204	4.00	PCSYSR*	PRCMR*	EMP	MT
Sidebotham (2001)	1413 8	2.53	NV-Q	CPS ⁺	PH, SX, EMP	MT
Sidebotham (2006)	1425 6	2.53	NV-Q	CPS ⁺	MT	MT
Simmel (2016)	268	14.1	NV-I	CPS ⁺	MT	N, EMP
Simons (1991)						
Female G3	236	12.70	CTS*	CTS*	MT	MT
Male G3	215	12.70	CTS*	CTS*	MT	MT
Simons (1995)	333	12.70	CTS*	CTS*	PH	PH
Smith (1991)	90	1.42	NV-I	HR ⁺	PH	PH
					PH, MT,	
Smith (1975)	187	2.50	NV-I	HR ⁺	EMP	PH
Speizer (2008)	1448	9.00	NV-I	NV-I	PH, EMP	PH, EMP
Stattin (1998)						
G1/G2 females	90	9.92	NV-I	NV-I	PH	PH

G1/G2 males	122	9.00	NV-I	NV-I	PH	PH
Tajima (2010)						
Cambodian	153	13.20	NV-I	CTS*	PH	PH
Vietnamese	155	13.20	NV-I	CTS*	PH	PH
Taplin (2013)	171	8.00	CECAQ*	CPS ⁺	PH, SX, N	MT
Thompson (2006)	220	0.83	LONGSCAN *	CPS ⁺	PH, SX	MT
Thornberry (2014)	816	13.55	CPS ⁺	CPS ⁺	MT	MT
Tomison (1994)	179	8.51	CPS ⁺	CR ⁺	MT	MT
Trocmé (2004)	2891	7.50	CIS98 ⁺	CPS ⁺	MT	MT
Umeda (2015)	1186	5.00	CTS*	CTS*	PH, SX, N	PH
Valentino (2012)	70	18.00	CTQ*	CTQ*	MT	MT
Veracruz (2018)	4102	-	NCS*	NCS-R*	ALL exc. EMP	PH
Wang (2014)	761	9.73	PCCTS*	PCCTS*	PH	PH
Wearick-Silva (2014)	123	-	CTQ*	CPS ⁺	ALL	SX
Webster-Stratton (1985)	40	4.79	NV-Q	CPS ⁺	MT	PH, MT
Wekerle (2007)	7672	7.50	CPS ⁺	CPS ⁺	MT	PH, SX, N
Whipple (1991)	123	4.54	NV-I	CPS ⁺ , OBS CPS ⁺ , CTS*,	MT	PH
Widom (2015)	1147	22.80	CPS ⁺	CEQ*	ALL exc. EMP	ALL exc. EMP
Wolock (1979)	519	-	NV-I	CPS ⁺	PH, N	MT
Zajac (2009)	198	13.00	SLESQ*	CTS*	PH, SX PH, N,	PH, EMP
Zalewski (2013)	95	15.05	CTQ*	PBI*	EMP	EMP
Zavala (2013)	860	-	NV-Q	NV-Q	PH	PH
Zuravin (1996)	213	6.00	NV-Q	CPS ⁺	ALL exc. EMP	MT

Note. Measurement type: CA = Clinical assessment; CPS = Child Protective Service records; CR = Case review; CREC = Court records; HR = Hospital records; I = Interview; NV = Non-validated measure; OBS = Observer report; OR = Offender records; Q = Questionnaire

Measurement instrument: AAPI = Adult-Adolescent Parenting Inventory; ACES = Adverse Childhood Experiences; AEIII = Assessing Environments-III; AMP = About My Parent (History of Neglect) Scale; API = Abuse and Perpetration Inventory; ASI = Addiction Severity Index; BDPAI = Brofenbrenner-Devereux Parental Activity Inventory; CARE = Child and Adolescent Review of Experiences; CAQ = Child Abuse Questionnaire; CECAQ = Childhood Experience of Care and Abuse Questionnaire; CEQ = Childhood Experiences Questionnaire; CHQ = Childhood History Questionnaire; CIS98 = 1998 Canadian Incidence Study of Reported Child Maltreatment; CMHI = Cook-Medley Hostility Scale; CSAI = Childhood Sexual Abuse Interview; CTQ = Childhood Trauma Questionnaire; CTS = Conflict Tactics Scale; EASEPI = Exposure to Abusive and Supportive Environments Parenting Inventory; EPAB = Emotional and Physical Abuse Questionnaire; LEC = Life Events Checklist; LONGSCAN = Longitudinal Studies of Child Abuse and Neglect; MDHQ = Mothers' Developmental History Questionnaire;

NCS = National Comorbidity Survey; PARQ = Parental Acceptance and Rejection Questionnaire; PBC = Parent Behaviour Checklist; PBI = Parental Bonding Instrument; PCCTS = Parent-Child Conflict Tactics Scale; PCRQ = Parent-Child Relationship Questionnaire; PCSYSR = Psychological Control Scale Youth Self-Report; PDI = Parenting Dimensions Inventory; PPS = Parental Punitiveness Scale; PRCMR = Parental Responses to Child Misbehavior-Revised; PS = Parenting Scale; PSI = Parenting Stress Index; PSY = Psychological Maltreatment Scale; SES = Sexual Experiences Survey; SLESQ = Stressful Life Events Screening Questionnaire; SSQ = Sexual Stress Questionnaire; THQ = Trauma History Questionnaire

Maltreatment type: EMP = Emotional/psychological maltreatment; MT = Multitype maltreatment; N = Neglect; PH = Physical maltreatment; SX = Sexual abuse; ALL = each of the maltreatment types previously listed; DV = domestic violence

Study design: EC = Epidemiological cross-sectional study design; IT = Intervention study design; L = Longitudinal study design; PC = Prospective cohort study design; RC = Retrospective cross-sectional study design.

* validated instrument

+ official record

^a If two ages are provided, the study was longitudinal and the age reported is the age of G3 at the time maltreatment was reported.

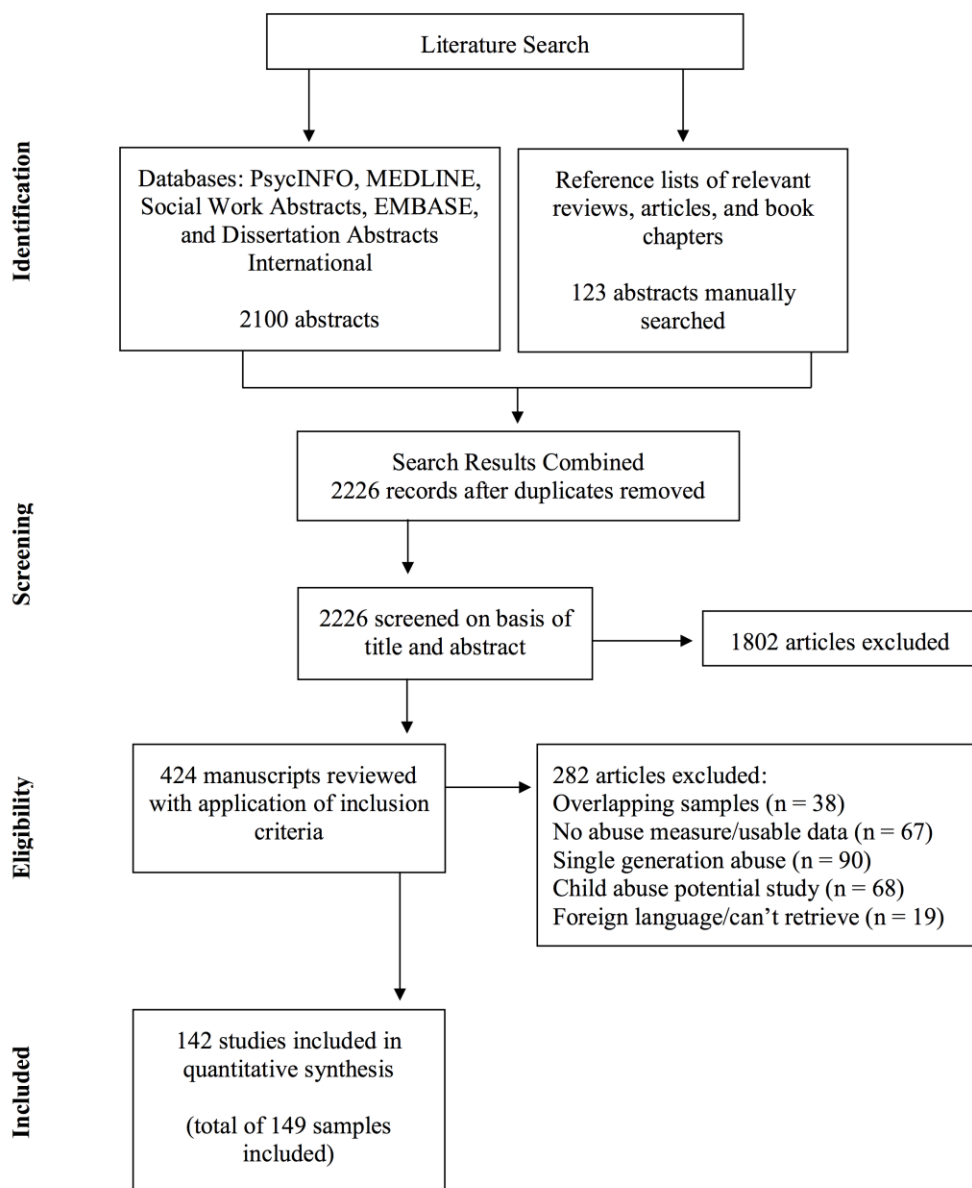


Figure 1. PRISMA Flow Diagram

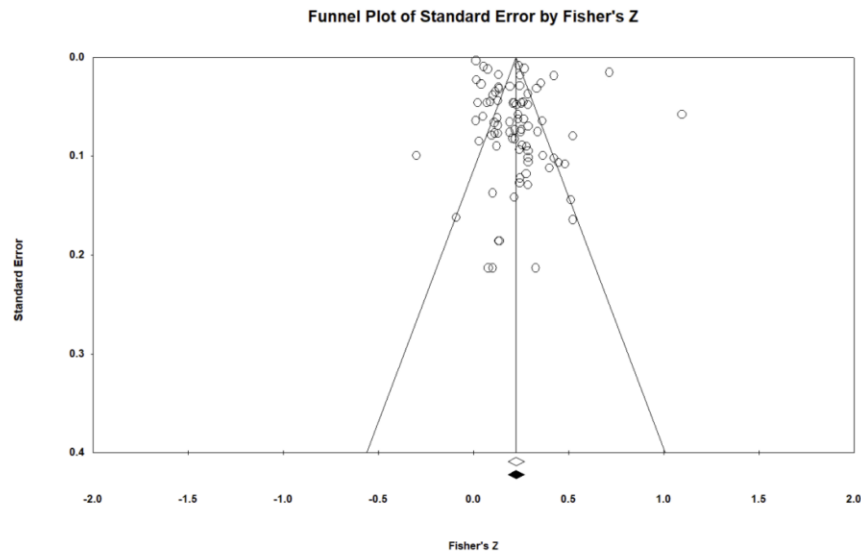


Figure 2. Funnel plot of the meta-analysis on the intergenerational transmission of maltreatment (N=80).

Note: The y-axis on the funnel plot represents the standard error, and the x-axis represents the effect size. White circles indicate studies that were included in the metaanalysis. The diamonds at the bottom of the funnel plot represent the observed and adjusted effect sizes. Studies with large sample sizes appear toward the top of the graph, and smaller studies appear toward the bottom of the graph (due to greater sampling variation in effect size estimates in the smaller studies). Studies were symmetrically distributed around the combined effect size, thus, no publication bias was suggested.

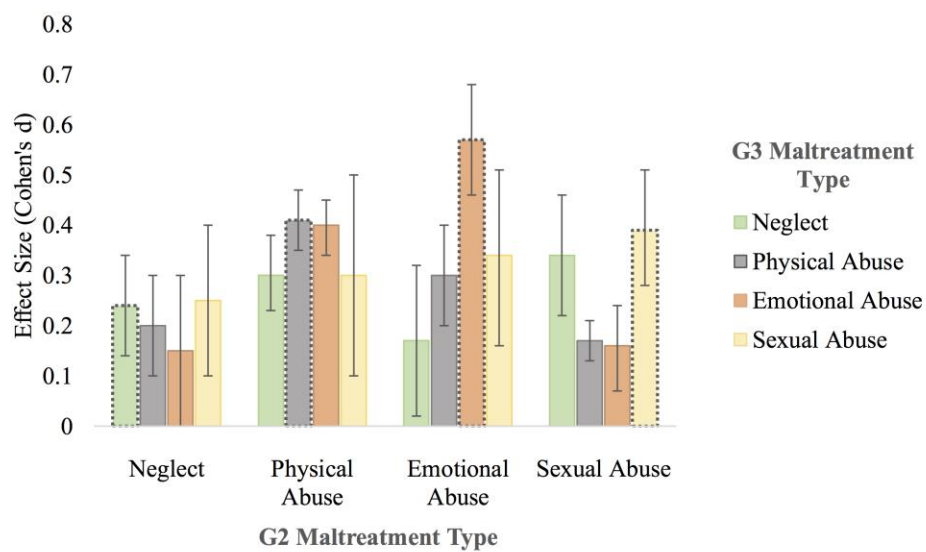


Figure 3. Comparison of Homotypic and Heterotypic Transmission Effect Sizes from G2 to G3 with 85% confidence intervals.

Note. Homotypic continuity for each maltreatment type is indicated by dotted line.

Supplemental Table 1

Study Quality Scoring for Each Study Included in the Meta-Analysis

Study	Representative Sample ^a	Participation/ Attrition ^b	Mal./Not Mal. Samples Included ^a	Mal. Status Assessed in Not Maltreated Group ^a	Controls ^c	Prospective G2 ^d	Prospective G3 ^d	Multiple Reporters ^e	Same Exposure for Mal. and Not Mal. Groups ^a	Exposure Period ^f	Valid G2 ^g	Valid G3 ^g	Mal. Defined ^a	Total /13
Abolfotouh (2009)	1	0	1	0	1	0	0	0	1	1	0	0	0	5
Adamson (1997)	0	1	1	0	1	0	0	1	1	1	1	1	0	8
Altemeier (1982)	1	1	1	1	0	0	1	1	1	0	0	1	0	8
Appleyard (2011)	1	1	1	1	1	0	1	1	1	0	1	1	1	11
Avery (2002)	0	0	1	1	1	0	0	1	1	1	0	1	0	7
Bailey (2007)	0	1	1	1	1	0	1	1	1	1	0	0	1	9
Baldwin (1975)	0	0	0	1	0	0	0	1	0	0	1	1	1	5
Ball (2009)	0	1	1	0	1	0	0	0	1	0	1	1	1	7
Banyard (1997)	0	1	1	0	1	0	0	0	0	0	0	1	1	5
Banyard (2003)	0	1	1	1	1	0	1	0	1	1	1	1	1	10
Barrett (2009)	1	1	1	1	1	0	0	0	1	1	0	1	1	9
Bartlett (2017)	1	0	1	1	1	0	1	1	1	1	1	1	0	10

Ben-David (2015)	1	1	1	1	1	0	1	1	1	1	1	1	0	11
Brodsky (2008)	0	0	1	1	1	0	0	1	1	1	1	1	1	9
Caykoylu (2011)	0	0	1	1	0	0	0	0	1	0	0	0	1	4
Choi (2018)	1	1	1	1	1	0	1	0	1	1	1	1	1	11
Cicchetti (2006)	0	0	1	1	1	0	0	1	1	0	1	1	1	8
Clément (2005)	1	1	1	0	0	0	0	0	1	1	0	1	0	6
Cohen (2008)	0	1	1	0	1	0	0	0	1	1	1	1	1	8
Cole (1992)	0	0	1	1	1	0	0	0	1	1	0	1	0	6
Coohey (1997)	0	1	1	1	1	0	0	1	0	1	1	1	1	9
Cort (2011)	0	0	1	1	1	0	0	1	1	1	1	1	1	9
Covell (1995)	0	1	1	1	0	0	0	1	1	0	0	0	0	5
Crombach (2015)	0	1	1	1	1	0	0	0	1	0	0	0	0	5
DeBruyn (1992)	0	0	1	1	1	0	0	1	1	1	1	1	1	9
Dias (2014)	0	0	1	0	1	0	0	1	1	1	1	1	0	7
Dietz (2000)	1	0	1	0	1	0	0	0	1	1	1	1	0	7
DiLillo (2000)	0	0	1	1	1	0	0	0	1	0	0	1	1	6
Disbrow (1977)	0	0	1	1	1	0	0	1	1	0	0	1	0	6
Dixon (2005)	1	1	1	0	1	0	1	1	1	0	1	1	0	9
Dubowitz (1987)	0	1	1	0	1	0	0	1	1	0	0	1	1	7
Dubowitz (2001)	0	0	1	1	1	0	0	0	1	1	0	1	0	6
Duckworth (1997)	0	0	0	1	0	0	0	0	1	0	1	1	1	5

Duhamel (2009)	0	0	1	1	1	0	0	0	1	1	1	1	0	7
Dworsky (2015)	0	1	0	0	1	0	1	1	1	0	1	1	0	7
Egeland (1996)	0	1	1	1	0	0	1	1	1	0	0	0	1	7
Enlow (2016)	0	0	1	1	1	0	1	1	1	1	0	1	1	9
Esaki (2008)	0	1	1	1	1	0	1	1	1	1	0	1	0	9
Éthier (1995)	0	0	1	1	1	0	0	1	1	0	1	1	1	8
Falbo (2004)	0	1	1	1	0	0	0	0	1	0	0	0	1	5
Ferrari (2002)	0	1	1	1	0	0	0	0	1	0	1	0	0	5
Finkelhor (1997)	1	1	1	1	1	0	0	0	1	1	1	1	1	10
Folsom (2003)	0	1	1	0	0	0	0	1	1	1	0	1	1	7
Francis (2008)	0	0	1	1	1	0	0	1	1	0	1	1	0	7
Fujiwara (2010)	0	1	1	0	1	0	0	0	1	1	1	0	1	7
Fuller (2003)	1	1	1	1	1	0	0	1	1	1	1	1	0	10
Gage (2010)	1	1	1	0	1	0	0	0	1	0	0	1	1	7
Glasser (2001)	1	1	1	0	0	0	0	1	1	0	1	1	1	8
Goodwin (1981)	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grusec (1991)	0	0	1	0	0	0	0	1	1	0	0	0	0	3
Haapasalo (1999)	0	0	1	1	1	0	0	1	1	1	0	1	0	7
Healy (1991)	0	1	1	1	0	0	0	1	0	0	0	1	1	6
Hemenway (1994)	1	0	1	1	1	0	0	0	1	0	0	0	0	5
Herrenkohl (1983)	0	0	1	1	1	0	0	0	1	1	0	0	1	4

Herrenkohl (2013)	0	1	1	1	1	1	1	1	1	1	0	0	1	10
Heyman (2002)	1	0	1	1	1	0	0	0	1	0	0	1	1	7
Hunter (1979)	0	1	1	1	0	0	1	1	1	0	0	1	0	7
Isumi (2016)	1	1	1	1	1	0	0	0	1	0	1	0	1	8
Jackson (1999)	1	1	1	0	1	0	0	0	1	1	1	1	1	9
Jaffee (2013)	1	1	1	1	1	0	1	0	1	1	1	0	0	9
Jamal (2011)	1	0	1	0	0	0	0	0	1	1	0	1	1	6
Joo (2008)	0	0	1	0	1	0	0	0	1	1	1	0	1	6
Kim, H. (2010)	0	1	1	1	0	0	1	0	1	0	1	1	0	7
Kim, J. (2009)	1	0	1	0	1	0	1	0	1	0	0	0	0	5
Kim, J. (2017)	1	1	1	1	1	0	0	0	1	1	0	0	1	8
Kim, K. (2007)	0	1	1	1	1	0	1	1	1	1	1	1	0	10
Kim, K. (2010)	0	1	1	1	1	0	0	0	1	0	1	1	1	8
Kotelchuk (1982)	0	1	1	0	1	0	0	1	1	0	0	1	0	6
Kovan (2009)	0	1	1	1	1	0	1	1	1	1	1	1	0	10
Leifer (2004)	0	1	1	1	1	0	0	1	1	1	0	1	0	8
Lesnik-Oberstein (1995)	0	0	1	0	1	0	0	1	0	0	0	1	1	5
Libby (2008)	0	1	1	1	1	0	0	0	1	0	1	0	1	7
Lukek (2015)	0	1	1	1	0	0	0	0	1	1	1	1	0	7
Macias (2004)	0	0	0	1	0	0	0	1	1	1	0	1	0	5
Maida (2005)	0	0	1	0	0	0	0	1	1	1	0	1	1	6

Massé (1994)	0	0	1	1	1	0	0	1	0	1	0	1	1	7
Matos (2014)	0	1	0	0	0	0	0	0	1	1	0	0	0	3
McCloskey (2000)	0	0	1	0	0	0	0	1	1	1	0	0	1	5
Medley (2009)	1	1	1	0	1	0	0	0	1	0	1	0	1	7
Milaniak (2015)	0	1	1	1	1	0	1	1	1	1	1	1	0	10
Militza (2010)	1	0	1	1	0	0	0	1	1	1	0	0	1	7
Miller (1999)	0	1	1	0	1	0	0	0	1	1	1	1	1	8
Miller (2000)	0	0	1	1	1	0	0	0	1	1	1	1	0	7
Mirabella-Beck (1999)	0	1	1	1	0	0	1	1	1	0	1	1	1	7
Muller (1995)	0	1	1	1	0	0	0	1	1	1	1	1	1	9
Murphy-Cowan (1999)	1	0	1	0	1	0	0	0	1	1	0	1	1	7
Narayan (2016)	0	0	1	0	1	0	0	0	1	1	1	1	0	6
Newcomb (2001)	1	0	1	0	0	0	0	0	1	0	1	1	0	5
Ney (1988)	1	1	1	1	0	0	0	1	0	1	0	0	0	6
Noll (2009)	0	1	1	1	1	1	1	1	1	0	1	0	1	10
Oates (1998)	1	0	1	1	0	0	0	1	1	1	0	1	0	7
Özcan (2016)	0	0	1	0	0	0	0	1	1	1	1	1	0	6
Pears (2001)	0	1	1	0	1	0	1	1	1	1	1	1	1	10
Peltonen (2014)	1	0	1	1	1	0	0	0	1	1	0	1	1	8
Perepletchikova (2014)	0	1	1	1	1	0	0	1	0	1	1	1	0	8
Pérez (2003)	0	0	1	1	0	0	0	1	1	1	1	1	1	8

Plant (2013)	1	1	1	1	1	0	1	1	1	1	1	1	0	11
Putnam-Hornstein (2015)	0	1	1	0	1	0	1	1	1	0	1	1	1	9
Ramírez (2011)	1	1	1	1	1	0	0	0	1	1	0	0	1	8
Renner (2006)	0	1	1	1	1	0	0	1	1	1	0	1	1	9
Rijlaarsdam (2014)	1	1	1	0	1	0	0	0	1	0	1	1	1	8
Rikić (2017)	0	0	1	0	1	0	0	0	1	0	1	1	0	5
Roberts (2015)	0	0	1	0	1	0	0	1	1	1	1	1	1	8
Rodriguez (1999)	1	0	1	1	1	0	0	0	1	1	0	0	0	6
Romero (2005)	1	1	1	0	1	0	0	0	1	1	1	1	0	8
Sahin (2011)	1	1	1	0	1	0	0	0	1	0	0	0	1	6
Saile (2014)	0	0	1	0	1	0	0	1	1	1	1	1	1	8
Salzinger (1992)	0	0	1	1	1	0	0	1	1	1	0	1	1	8
Scaramella (2003)	0	1	1	0	0	0	1	1	1	0	0	0	1	6
Schluter (2011)	1	1	1	1	0	0	1	0	1	0	1	1	0	8
Seay (2016)	0	1	1	1	1	0	0	0	1	1	1	1	0	8
Sidebotham (2001)	1	1	1	0	1	0	1	1	1	1	1	1	1	11
Sidebotham (2006)	1	1	1	0	1	0	1	1	1	1	0	1	0	9
Simmel (2016)	0	0	0	0	0	0	0	1	1	1	1	1	0	5
Simons (1991)	0	1	1	1	0	0	0	1	1	1	1	1	1	9
Simons (1995)	0	1	1	1	0	0	1	1	1	1	1	1	1	10
Smith (1991)	0	1	1	1	1	0	0	1	1	0	0	1	0	7

Smith (1975)	0	0	0	0	1	0	0	1	0	0	0	1	0	3
Speizer (2008)	1	1	1	0	1	0	0	0	1	0	0	0	0	5
Stattin (1998)	1	1	1	1	1	0	1	1	1	1	0	0	0	9
Tajima (2010)	0	1	1	0	1	0	0	0	1	1	1	1	0	7
Taplin (2013)	0	0	1	0	1	0	0	0	1	0	1	1	0	5
Thompson (2006)	0	1	1	1	1	0	0	1	1	0	1	1	0	8
Thornberry (2014)	0	1	1	1	1	0	1	1	1	1	1	1	1	11
Tomison (1994)	0	0	1	1	1	0	0	1	1	1	1	1	0	8
Troc�� (2004)	0	0	0	1	1	0	0	1	1	1	0	1	0	6
Umeda (2015)	1	0	1	0	1	0	0	0	1	0	1	1	1	7
Valentino (2012)	0	0	1	0	1	0	0	1	1	1	1	1	1	8
Veracruz (2018)	1	0	1	1	1	0	0	0	1	0	0	0	1	6
Wang (2014)	0	1	1	0	1	0	0	0	1	1	1	1	0	7
Wearick-Silva (2014)	0	0	1	0	1	0	0	1	0	1	1	1	0	6
Webster-Stratton (1985)	0	0	1	0	0	0	0	1	1	1	1	1	1	7
Wekerle (2007)	1	1	0	1	1	0	0	1	1	1	1	1	1	10
Whipple (1991)	0	0	1	1	0	0	0	1	1	1	1	1	1	8
Widom (2015)	1	1	1	1	1	1	1	1	1	1	1	1	0	12
Wolock (1979)	0	1	1	0	0	0	0	1	0	0	0	1	1	5
Zajac (2009)	0	1	1	1	1	0	1	1	1	1	1	1	0	10
Zalewski (2013)	0	0	1	1	1	0	0	1	1	1	1	1	0	8

Zavala (2013)	0	1	1	1	1	0	0	0	1	0	0	0	1	6
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Mal. = Maltreatment

^a 0 = no; 1 = yes

^b 0 = unacceptable (participation < 60% or attrition > 40%); 1 = acceptable (participation > 60% or attrition < 39%)

^c 0 = no controls/matching; 1 = controls in recruitment or analysis

^d 0 = retrospective; 1 = prospective

^e 0 = single reporter; 1 = multiple reporters

^f 0 = low follow-up or exposure period (child age < 5 yrs); 0 = acceptable follow-up or exposure period (child age ≥ 5 yrs)

^g 0 = measure not validated; 1 = validated measure or official record

Supplemental Figure 1. Overview of Reported Effect Sizes for Different Types of Measurements of Maltreatment

