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# Risk factors in child maltreatment: A meta-analytic review of the literature ☆

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ABSTRACT

This review presents the results of a series of meta-analyses identifying the relative strength of various risk factors for child physical abuse and neglect. Data from 155 studies examining 39 different risk factors were included in the review. Large effect sizes were found between child physical abuse and three risk factors (parent anger/hyper-reactivity, family conflict and family cohesion). Large effect sizes were also found between child neglect and five risk factors (parent–child relationship, parent perceives child as problem, parent's level of stress, parent anger/hyper-reactivity, and parent self-esteem).



**Contents**



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## 1. Introduction

Maltreatment of children is a prevalent social problem. The National Clearinghouse on Child Abuse and Neglect reported that in 2002 an estimated 896,000 children were the victims of child abuse or neglect. Child physical abuse is defined as non-accidental injury (including bruises, welts, cuts, burns, broken bones, or other tissue damage) to the child inflicted by a parent or a caregiver in a parenting role. Child neglect is defined as failure of a parent or a caregiver in a parenting role to provide adequate supervision, safety, medical care, education, or other necessities to the child. Although a large number of studies have examined risk factors for child maltreatment, the findings of these studies are inconclusive. In addition, although child neglect has been consistently shown to be the most frequently substantiated type of child maltreatment, research on child neglect is limited (Schumacher, Slep & Heyman, 2001). However, the research that has been conducted (e.g., McDonald & Marks, 1991) indicates that while there is some overlap in factors related to abuse and neglect, the best prediction of re-abuse is attained when abuse and neglect are analyzed separately. Therefore, the present study summarizes the literature on child physical abuse and neglect and uses a meta-analytic design to determine the strength of the relationship between each risk factor and abuse or neglect across the literature as a whole. While other types of child maltreatment have been examined in the literature, i.e., child sexual abuse, emotional abuse and undifferentiated child maltreatment, the focus of this review is limited to two types of child maltreatment, i.e., child physical abuse and child neglect.

## 2. Review of literature

Empirical literature on child abuse has shifted in focus over the past several decades. Earlier studies tended to focus more on psychological and personality characteristics of the offender, especially those of the mother. Later studies have examined a variety of factors pertaining to family members, the family system, and the environmental milieu. Previous reviews of demonstrate this trend. Baumrind (1995) reviewed literature on parent psychological factors and child abuse. She notes that although in the 1950s and 1960s child abuse was seen as a product of parent psychopathology, studies in the 1970s found psychopathology to be rare in abusive parents. Studies also failed to identify a specific psychological or personality pattern in abusive parents. Nevertheless, recent research has not abandoned the study of parent psychological risk factors. Parent depression and impulse control problems in particular are consistently shown to be positively related to both child abuse and neglect.

The literature on parent biological, cognitive, affective, and behavioral factors in child physical abuse is summarized by Milner and Chilamkurti (1991) and by Milner and Dopke (1997). These reviews indicated that parental low self-esteem, depression, psychopathology, history of childhood abuse, and social isolation, among other factors, are at least somewhat consistently positively related to child physical abuse. Studies are also somewhat consistent in finding abusive parents to be more psychophysiologically reactive to aversive child stimuli, to have unrealistic expectations of the child (either too high or too low), to use more coercive discipline than inductive reasoning, to have less interaction with the child, to be more negative than positive in interactions with the child, and to see the child as a problem child or as acting to intentionally annoy (Milner & Chilamkurti, 1991; Milner & Dopke, 1997). McCanne and Milner (1991) investigated psychophysiological reactivity in detail, summarizing six studies. They determined that although there appears to be a positive relationship between reactivity and abuse, not all physiological measures consistently indicate such a pattern.

Milner and Chilamkurti (1991) also found that the few studies on parent substance abuse and child physical abuse suggest a positive relationship between the two, particularly in the case of alcohol abuse. Studies were inconsistent in the finding of a relationship between abuse and parents' ability to read child emotional cues. Finally, Hazler and Denham (2002) supported the findings of Milner and Chilamkurti (1991) and Milner and Dopke (1997) by reviewing several studies on social isolation and child abuse and neglect, all of which found a significant positive relationship to exist.

None of the empirical literature reviews to date have cited demographic factors as particularly important in relation to child physical abuse or neglect. Moreover, Buchholtz and Korn-Bursztyn (1993) reviewed the literature on teen parenting and child maltreatment and concluded that the high levels of abuse reported in the applicable studies seemed to reflect constructs other than age of the parent, including depression and life stress. Furthermore, Giles-Sims (1997) reviewed the literature on non-biological parents and found mixed support for a higher prevalence of physical abuse in stepfamilies.

Some reviews have focused solely on child-related factors. Veltman and Browne (2001) reviewed 65 studies examining the relationship between child maltreatment and school performance and language development. Most, but not all, of these studies found delayed development and poor school performance among maltreated children. A review of the literature on child disability and maltreatment showed what little research exists on the subject to be inconsistent (Westcott, 1991). Furthermore, Dubowitz (1999) found no consistent relationship across studies between child neglect and child age, gender, or developmental problems. Dubowitz also reviewed studies examining parent factors in neglect. His findings supported those of Milner and Chilamkurti (1991), Milner and Dopke (1997), and Hazler and Denham (2002), with parent stress, non-responsivity/negativity toward the child, social isolation, depression, unrealistic expectations, poor parenting skills, substance abuse, and history of childhood abuse being consistently shown to be positively related to neglect.

Belsky (1993) also reviewed the research on risk factors in child physical abuse and neglect examining multiple levels of factors, including those pertaining to individual family members, the family system, interaction with the community, and societal factors. His findings supported those of Milner and Chilamkurti (1991), Milner and Dopke (1997), Dubowitz (1999), and Hazler and Denham (2002) regarding the risk factors of childhood history of abuse, that is, depression, psychopathology, self-esteem, psychophysiological reactivity, coercive discipline, social isolation, non-responsivity/negativity toward the child, and belief that the child has a behavior problem or acts to intentionally annoy. Like Buchholtz and Korn-Bursztyn (1993), Belsky found no consistent relationship between child disability and maltreatment. Belsky also supported Dubowitz in finding inconsistency across studies on child age.

The inconsistency of the findings across studies warrants the use of meta-analytic methods to interpret the research. To date, only two reviews have calculated effect sizes. One study examined risk factors for physical abuse (Black, Heyman & Slep, 2001) and one examined risk factors for neglect (Schumacher et al., 2001). Black et al. (2001) reviewed 46 studies examining parent and child cognitive, psychological, demographic, intelligence, and historical factors, as well as social isolation, family factors, and parent–child interaction factors and child physical abuse. The results of reviewed studies were summarized and an effect size was computed for each study. No composite effect sizes were computed for the purposes of summarizing all studies on a given factor and no general conclusions were offered regarding relative strength of the various risk factors examined. However, most demographic variables did not appear to be important risk factors for child physical abuse. Moderate to strong positive effect sizes were found for mother's tendency toward loneliness and isolation, fear of being controlled and impulsivity. Most adjustment variables (social support, interpersonal problems, etc.) were moderately strongly associated with child abuse. Several cognitive risk factors had moderate to strong positive associates with child abuse. Abusive mothers were more likely to make internal and stable attributions about their children's negative behavior and more negative and higher

than normal expectations of their children, as well as less understanding of appropriate developmental norms. Also, negative affect and autonomic nervous system arousal by parents' were positively related to child abuse. Finally, abusive mothers were more likely to use harsh discipline strategies and verbal aggression and less likely to use positive strategies than non-abusive mothers. Schumacher et al. reviewed 10 studies examining the relationship between some of these factors and child neglect. Parent psychological and behavioral characteristics had the largest effect sizes, although effect sizes could not be computed for most factors due to a small body of literature on neglect.

The purpose of the present study is to summarize the literature on a variety of risk factors for child physical abuse and neglect. This study adds to the existing literature by providing composite effect sizes indicating the strength of the relationship between each respective factor and child physical abuse or neglect. These composite effect sizes provide some indication of the importance of each risk factor relative to other risk factors.

## 3. Theoretical perspective

Much of the research on child maltreatment to date is guided by the theory that maltreatment stems from individual pathology. This focus on individual pathology is evident from the large number of studies examining risk factors pertaining to the offending parent (Buchholtz & Korn-Bursztyn, 1993; Giles-Sims, 1997; Hazler & Denham, 2002; McCanne & Milner, 1991; Milner & Chilamkurti, 1991; Milner & Dopke, 1997) and to the child victim (Veltman & Browne, 2001; Westcott, 1991). However, because child maltreatment occurs in a family context, family-level factors should also be considered. In this study, ecological theory guided the choice of risk factors to be examined. This theory originated with Bronfenbrenner (1979), who explains child development based on multiple levels of embedded systems. These levels range from the proximal child environment (i.e., school, home, and peer group) to more distal social structures to the larger culture. Ecological theory considers each level as relevant to child development.

For the purposes of this study, we examine various microsystems of the ecological model for child physical abuse and neglect. We recognize that important work has examined more distal social structures and community factors but have chosen to focus on the factors most closely related to the individual child for this review. We predicted that variables most proximal to the experience of child maltreatment would have the strongest effect sizes and variables most distal from the experience of child maltreatment would have the smallest effect sizes. Since child abuse involves both child and parent, we considered parent–child interaction and/or parent's report of the child's behavior to be most proximal to the issue of child abuse. For the next microsystem level, we considered parent characteristics the next most proximal level since parents are the perpetrators of abuse. We then looked at child characteristics (excluding parent) and finally, we examined the microsystemic factors we considered most distal, family characteristics. This project was commissioned by the U.S. Department of Defense Military Family Advocacy Program to guide the development of a child abuse risk assessment instrument. The Family Advocacy Program works to prevent and intervene with all types of family maltreatment experienced by military families. Risk factors were identified through initial perusal of the literature reviews on child abuse and neglect cited above and iteratively throughout the study coding process. In addition, a panel of military clinicians and researchers was convened to suggest additional factors they thought would be important to examine.

### 3.1. Parent–child interaction or parental report of child behavior

In the microsystem level determined to be most proximal to the abuse, parent–child interaction or parental report of child behavior, we attempted to calculate effect sizes for six factors for child physical abuse and for child neglect. The factors examined here included *parent–child relationship* (the studies in this category primarily involved coding of parent–child interaction and/or child attachment to parent behaviors), *parenting behaviors* [the studies in this category included studies of parenting styles using measures such as, the Child-rearing Practices Q-Sort (Block, Block, & Morrison, 1981); surveys measuring the parent's ability to plan or carry out to completion effective interactions with their children, such as the Parent Problem Solving Instrument (Wasik, Day, & Wasik, 1980); studies which examined parent's unrealistic expectations of their child with measures such as the Developmental Expectation Questionnaire derived from the Vineland Social Maturity Index (Doll and McKnight, 1965); and studies which examined parental level of empathy toward the child with measures such as the Empathy Scales (Scotland, 1969)]. We also looked at the *parent's perception of the child as a problem*. Studies included in this factor included studies where the parent completed assessments of the child using measures such as the Child Behavior Checklist (Achenbach & Edelbrock, 1983). We also looked at whether the *pregnancy with the abused child was unwanted or unplanned*, parent's *use of corporal punishment*, and *parent stress regarding parenting* [this variable included studies that used measures such as the Parenting Stress Index (Abidin, 1995) to measure the parent's level of stress specifically regarding parenting].

### 3.2. Parent characteristics independent of the child

The next more distal microsystemic level included 19 factors related to parent characteristics independent of the child. These factors included the *age*, *gender*, and *employment status* of the offending parent and whether or not the offending parent is a *single parent*. This level also included measures of the parent's *drug abuse*, *alcohol abuse* (not including other drugs), *health problems*, *anxiety*, *depression*, *personal stress*, *self-esteem*, and *psychopathology* (this variable included any measure of mental illness besides depression or anxiety including schizophrenia, bipolar disorder, etc.). In this level we also included *poor relationship with own parents* (either as an adult or as a child), *past criminal behavior* (including violent outside the home) and level of *anger/hyper-reactivity* [this factor assesses the parent's agitation, physiological arousal, and negative affect in response to a given stimulus (measured in laboratory studies) and global measures of hostility measured by instruments such as the Buss-Durkee Hostility Inventory (Buss & Durkee, 1957) and the Mood Adjective Checklist (Frodi, A. M., & Lamb, M. E., 1978.)]. We also looked at parent's experience of *childhood abuse*, parent's level of *social support*, parent's *coping or problem-solving skills* [measured by scales such as the Problem Solving Inventory (Heppner & Peterson, 1982)] and parent's *approval of corporal punishment*.

### 3.3. Child characteristics, excluding parents

Within the microsystem that contained child characteristics, excluding parents, we attempted to calculate effect sizes for seven factors for child physical abuse and the same factors for child neglect. For the studies to fit in this microsystem level, the assessment of child behavior or problem needed to come from an external source, not the parent. We calculated effect sizes for *child gender*, *age*, and *disability* (professionally diagnosed physical, mental or learning disability). We also looked at studies examining child *social competence* (child's ability to interact well with peers assessed by individuals other than parents), child *externalizing behaviors* (disruptive behavior, aggression, delinquency, non-compliant behavior, etc.), child *internalizing behavior* (withdrawn behavior, depression, sadness, etc.), and *prenatal/neonatal problems* of the child (problems or complications in child during pregnancy, delivery, or infancy).

### 3.4. Family factors

The most distal microsystemic level included seven family-related factors. We looked at *family conflict*, *family cohesion*, *spousal violence*,

*socio-economic status* of the family, *marital satisfaction*, *family size*, and whether or not there was a *non-biological parent in home*.

### 3.5. Hypotheses

Although factors from each of these microsystemic levels influence the occurrence of child abuse and neglect, since child abuse is an interactional phenomena, we hypothesized that the microsystem level which includes "parent–child interaction or parental report of child behavior" would have stronger effect sizes than would factors that from microsystemic levels representing more individual level factors ("child characteristics" or "parent characteristics") or "family factors" which might be more distant from the parent–child interaction. Although the offender, as an individual, enacts the behaviors defined as abusive or neglectful, these incidents occur, by definition, at a dyadic level and not solely within the individual.

## 4. Methods

Definitions or criteria for physical abuse and neglect vary from study to study. We did not include child sexual abuse, infanticide, Munchausen's syndrome by proxy or failure to thrive in our definition. Because risk factors for these types of abuse were likely to be different from risk factors for other forms of child physical abuse or neglect, studies examining these types of abuse were also not included in these analyses.

### 4.1. Literature search

Computer database searches were the primary method of identifying articles for inclusion in this study. The Psychological Abstracts International (PsychINFO) computer database was searched for all studies conducted to present including the keywords: "child abuse," "child maltreatment," "child physical abuse," and "child neglect." In addition to using the computer database, the reference list for each study was examined for additional potential studies to be included in the review. The literature search identified 867 relevant studies, which were obtained for possible inclusion in this meta-analysis.

### 4.2. Inclusion criteria

The inclusion of studies in this meta-analysis was based on several criteria (Johnson, 1989; Stith et al., 2000; Wampler & Serovick, 1996).

**Table 1**
Overall effect sizes for child physical abuse risk factors

| | *d* | CI | *r* | $Q^w$ | *k* | *N* |
|---|---|---|---|---|---|---|
| *Microsystem: parent–child interaction/parental report of child behavior* | | | | | | |
| Parent perceives child as problem | .62 | .53/.71 | .30*** | 57.68*** | 25 | 3317 |
| Unplanned pregnancy | .58 | .28/.89 | .28*** | .31 | 2 | 1490 |
| Parent–child relationships | −.55 | −.66/−.45 | −.27*** | 117.68*** | 32 | 1624 |
| Parent use of corporal punishment | .55 | .38/.72 | .26*** | 4.65 | 7 | 703 |
| Parenting behaviors | .34 | .24/.44 | .17*** | 130.85*** | 25 | 2956 |
| Stress over parenting | .15 | .00/.30 | .07*** | 51.14*** | 11 | 2075 |
| *Microsystem: parent characteristics independent of the child* | | | | | | |
| Anger/hyper-reactivity | .72 | .47/.97 | .34*** | 14.25* | 9 | 345 |
| Anxiety | .60 | .41/.79 | .29*** | 4.39 | 8 | 563 |
| Psychopathology | .59 | .48/.69 | .28*** | 62.21*** | 13 | 8630 |
| Depression | .55 | .45/.67 | .27*** | 46.18*** | 14 | 8258 |
| Self-esteem | −.50 | −.64/−.36 | −.24*** | 32.92*** | 11 | 2485 |
| Poor relationship with own parents | .44 | .34/.54 | .22*** | 20.38* | 11 | 2997 |
| Parent experienced childhood abuse | .44 | .34/.54 | .21*** | 78.55*** | 15 | 3722 |
| Criminal behaviors | .42 | .24/.60 | .21*** | .66 | 4 | 1963 |
| Personal stress | .39 | .29/.49 | .19*** | 50.74*** | 22 | 3114 |
| Social support | −.36 | −.45/−.28 | −.18*** | 65.32*** | 20 | 10,315 |
| Alcohol abuse | .34 | .19/.50 | .17*** | 8.06* | 3 | 654 |
| Unemployment | .30 | .19/.42 | .15*** | 29.57*** | 8 | 1263 |
| Parent coping and problem-solving skills | −.27 | −.52/−.02 | −.14* | 7.54* | 4 | 303 |
| Single parenthood | .24 | .19/.30 | .12*** | 108.23*** | 22 | 14,223 |
| Parent age | −.20 | −.26/−.14 | −.10*** | 234.05*** | 31 | 12,136 |
| Drug abuse | .16 | .01/.32 | .08* | 2.18 | 3 | 654 |
| Health problems | .22 | −.01/.45 | .11 | 3.17 | 3 | 286 |
| Parent gender | .13 | −.03/.30 | .07*** | .10 | 2 | 7309 |
| Approval of corporal punishment | .09 | −.11/.30 | .05 | 5.65 | 5 | 1674 |
| *Microsystem: child characteristics, excluding parents* | | | | | | |
| Child social competence | −.53 | −.64/−.42 | −.26*** | 27.46* | 14 | 1527 |
| Child externalizing behaviors | .47 | 1.39/.54 | .23*** | 135.69*** | 31 | 2874 |
| Child internalizing behaviors | .31 | .22/.40 | .15*** | 50.62*** | 23 | 2282 |
| Child gender | .08 | −.04/.19 | .04 | 6.10 | 13 | 1702 |
| Prenatal or neonatal problems | .08 | −.03/.19 | .04 | 15.34 | 10 | 1432 |
| Child disability | .02 | −.20/.24 | .01 | .8 | 4 | 325 |
| Child age | −.05 | −.14/.04 | −.02 | 12.63 | 14 | 3332 |
| *Microsystem: family characteristics* | | | | | | |
| Family conflict | .54 | .54/1.15 | .39*** | 16.02* | 5 | 170 |
| Family cohesion | −.68 | −.98/−.38 | −.32*** | 3.02 | 5 | 183 |
| Spousal violence | .46 | .31/.61 | .22*** | 3.82 | 5 | 773 |
| Marital satisfaction | −.32 | −.47/−.90 | −.16*** | 14.45* | 8 | 840 |
| Family size | .31 | .24/.38 | .15*** | 65.53*** | 23 | 11,224 |
| Socio-economic status | −.28 | −.36/−.20 | −.14*** | 41.45*** | 16 | 10,321 |
| Non-biological parent in home | −.05 | −.28/.17 | −.03 | 3.25 | 3 | 302 |

*$p<.05$; **$p<.01$; ***$p<.001$.
Note. *d*=*d*-value (numerical representation of the relationship between two risk factors corrected for sample size expressed in standard deviation units); CI=Confidence Interval; *r*=effect size expressed as correlation; $Q^w$=homogeneity within; *k*=number of effect sizes; *N*=sample size.

First, the study must empirically examine the relationship between the identified risk factor and either child physical abuse or child neglect. Second, as mentioned earlier, the maltreatment sample may not include perpetrators or victims of child sexual abuse, failure to thrive, Munchausen's syndrome by proxy, or infanticide. The rationale behind excluding these studies is that the profile and patterns associated with these acts is different from those associated with other forms of child maltreatment. Third, in order to be included, each study must use a non-abusive comparison group. Fourth, the perpetrators of child maltreatment in the study must be parents or in a parenting role. Fifth, included studies must not draw their entire sample from a special population (such as mentally handicapped parents). Sixth, each study must include the quantitative data necessary for the calculation of at least one effect size. Finally, each study must use an original sample. Results from separate studies using the same sample were included only if they reported data that could be used to calculate effect sizes for different variables or for different samples. Therefore, only one study using a particular sample was included in the meta-analytic review for each variable.

The literature search yielded a large number of studies for possible inclusion in the meta-analysis. This was due, in part, to the decision to use a broadly defined search. Of the 867 studies obtained, 712 were excluded from the study because they did not meet the above criteria. Two hundred and twelve studies were excluded because they contained no empirical data. Two hundred and sixty-eight studies were excluded because the sample of abusers or abused children did not differentiate between types of abuse (neglect or physical) or the sample included emotional abuse or the study did not examine a risk factor for child maltreatment that was on our list. Sixty-four studies were excluded because the sample included sexual abusers or sexual abuse victims. One hundred and four studies were excluded for lack of a comparison group, and eight were excluded because the comparison group was not non-abusive. One study was excluded because the perpetrator of the abuse was not a parent or in a parenting role. Thirteen studies were excluded because the entire sample represented a special population. Thirteen studies were excluded because they contained duplicate samples. Twenty-nine studies were excluded because they did not contain relevant data that could be converted to an effect size, given the statistics reported. When sufficient data were not provided and the study was not published before 1985, we made an attempt to contact the authors for these data. However, no additional data were received as a result of this effort. The remaining 155 studies (published between the years of 1969 and 2003) were retained for coding.

### 4.3. Coding

A codebook was designed for use in this study to capture information about individual studies including bibliographical information, sample information, study quality, and data for the calculation of effect sizes. In order to resolve problems with the codebook and establish consistent guidelines for coding studies, the entire research team coded the first several studies. After team consensus in coding became typical, two team members independently coded each of the remaining studies. Each study was then cross-coded jointly by both coders in order to compare codes and achieve congruence. In all cases, the occurrence of a disagreement in coding was recorded. Overall, coders agreed on 82% of codebook items. The rate of disagreement ranged from a low of 68% on subjective rating of study quality to 100% on a number of variables including type of publication outlet. When discrepancies occurred, the coding pair was encouraged to discuss the issue and make a joint decision as to how the particular item should be coded. Any discrepancies or questions that could not be resolved by the coding pair were brought to the remaining research team members.

### 4.4. Study quality

The quality of a meta-analysis is dependent on the quality of each of the studies included in the meta-analysis. If the individual studies are of poor quality, then the results of the meta-analysis might be questionable. In order to address this concern, the codebook included

**Table 2**
Overall effect sizes for child neglect risk factors

| | *d* | CI | *r* | $Q^w$ | *k* | *N* |
|---|---|---|---|---|---|---|
| *Microsystem: parent–child interaction/parental report of child behavior* | | | | | | |
| Parent–child relationships | −1.09 | −1.31/−.86 | −.48*** | 58.16*** | 11 | 400 |
| Parent perceives child as problem | .91 | .46/1.36 | .41*** | 4.91 | 4 | 87 |
| Parenting behaviors | .37 | .24/.50 | .18*** | 32.54*** | 8 | 1016 |
| Stress over parenting | .29 | .05/.53 | .14** | 40.82*** | 4 | 307 |
| *Microsystem: parent characteristics independent of the child* | | | | | | |
| Personal stress | .81 | .60/1.02 | .38*** | 24.84*** | 3 | 386 |
| Anger/hyper-reactivity | .74 | .42/1.06 | .35*** | 1.98 | 3 | 211 |
| Self-esteem | −.69 | −.99/−.38 | −.33*** | 1.98 | 4 | 184 |
| Psychopathology | .52 | .39/.66 | .25*** | 14.45* | 8 | 7652 |
| Unemployment | .51 | .35/.67 | .25*** | 8.69* | 4 | 719 |
| Depression | .42 | .32/.53 | .21*** | 15.93* | 8 | 8207 |
| Poor relationship with own parents | .39 | .25/.54 | .19*** | 15.40* | 7 | 855 |
| Social support | −.33 | −.43/−.24 | −.16*** | 55.11*** | 13 | 8582 |
| Parent experienced childhood abuse | .31 | .17/.45 | .15*** | 25.21*** | 6 | 1417 |
| Parent age | −.25 | −.36/−.13 | −.12*** | 19.94* | 9 | 8120 |
| Single parenthood | .16 | .03/.28 | .08*** | 13.41 | 9 | 7751 |
| *Microsystem: child characteristics, excluding parents* | | | | | | |
| Child social competence | −.62 | −.81/−.43 | −.30*** | 10.03 | 7 | 584 |
| Child externalizing behaviors | .45 | .31/.58 | .22*** | 35.37** | 17 | 956 |
| Child internalizing behaviors | .22 | .08/.36 | .11*** | 48.22*** | 11 | 922 |
| Child gender | .03 | −.17/.22 | .01 | .28 | 5 | 961 |
| Child age | −.02 | −.23/.19 | −.01 | 13.49 | 8 | 369 |
| *Microsystem: family factors* | | | | | | |
| Family size | .54 | .45/.64 | .26*** | 75.19*** | 12 | 8546 |
| Socio-economic status | −.39 | −.51/−.28 | −.19*** | 36.29*** | 10 | 7986 |

*$p<.05$; **$p<.01$; ***$p<.001$.
Note. *d*=*d*-value (numerical representation of the relationship between two risk factors corrected for sample size expressed in standard deviation units); CI=Confidence Interval; *r*=effect size expressed as correlation; $Q^w$=homogeneity within; *k*=number of effect sizes; *N*=sample size.

a scale that rated the quality of the study on eight dimensions. Study quality scores ranged from zero (poor) to four (excellent). Only six studies received a quality rating of zero (poor). Thirty-nine studies received a quality rating of one (below average). The remaining 166 studies received a rating of two (average) or three (above average). The mean study quality score was 1.83, with a standard deviation of .60. The median/mode study quality score was 2. Removal of the poor studies from the analysis did not alter any effect sizes by more than .02; therefore, no studies were excluded on the basis of quality.

### 4.5. Data analysis

We conducted 61 meta-analyses, one for each of the risk factors and child physical abuse and for the same ones (when data was available) and child neglect. Because the studies included in the meta-analyses used reported various statistics, we used *D-Stat: Software for the Meta-Analytic Review of Research Literatures* (Johnson, 1989) to transform all results into *d*-values, *g*-values, and *r*-values. *g*-Values are a numerical representation of the relationship between two variables expressed in standard deviation units, that is, they represent the standardized mean difference between the two groups (abusive and non-abusive) on the risk factor. The value may be positive or negative, with the sign indicating the direction of the relationship. A value of .00 indicates no relationship. *D*-values are *g*-values that have been corrected for sample size. *r*-Values represent the relationship between two variables expressed as point-biserial correlations or Pearson's *r*. In some studies, the authors reported findings as significant or non-significant but did not report specific statistics. In such cases, a significance level of .05 was entered in D-Stat for findings reported as significant, and a significance level of .5 was entered for findings reported as non-significant (Amato & Keith, 1991).

Because the risk factors used in this study were not all mutually exclusive, it was necessary to generate a single effect size for each risk factor within each study. For example, a number of studies included data from multiple measures or scales reflecting the same risk factor (as defined by this meta-analysis). To prevent studies producing multiple effect sizes from being over represented in the analysis, *z*-transformations were used to average effect sizes within a single study and produce a single effect size. The average *r*-value and the total sample size were entered into D-Stat, and a single effect size was calculated for each risk factor within each study. These effect sizes were used to calculate the composite effect size for the risk factor (Durlack, 1995; Johnson, 1989; Wampler & Serovick, 1996).

## 5. Results

### 5.1. Meta-analysis results

The coded studies produced 656 distinct effect sizes reflecting the relationship between one of the 39 risk factors and either child physical abuse or child neglect. These effect sizes were used to calculate composite effect sizes for each risk factor by each form of maltreatment. Composite effect sizes were calculated for 39 risk factors and child physical abuse (see Table 1) and for 22 risk factors and child neglect (see Table 2). No studies were found for 17 factors with child neglect. A list of each study's effect size, measures used and sample size for physical abuse is found in Table 3 and for neglect is found in Table 4.

Hanson (2000) has suggested one way of interpreting the magnitude of effect sizes (absolute values), stating that effect sizes may be considered large if they exceed *r*=.30, medium if they range from *r*=.20 to .30, and small if they range from *r*=.10 to .20. The magnitude of composite effect sizes reported in this study range (in absolute value) from very large (*r*=.48) to very small (*r*=.01). The

**Table 3**
Study, measure, sample size and effect sizes for each study used to calculate composite effect sizes for child physical abuse

| Microsystem: parent-child interaction/parent report of child behavior | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: parent perceives child as problem* | | | |
| Whipple and Webster-Stratton (1991; fathers) | Child Behavior Checklist; Eyberg child behavior inventory | 86 | .17 |
| Bradley and Peters (1991) | Eyberg child behavior inventory | 16 | .50* |
| Kinard (1995a,b) | Child Behavior Checklist | 164 | .31*** |
| Mash, Johnston and Kovitz (1983) | Child Behavior Checklist | 36 | .56*** |
| Graham, Weiner, Cobb and Henderson (2001) | Questionnaire (this study) | 47 | .45** |
| Perry, Doran and Wells (1983) | Washington symptom checklist | 42 | .36* |
| Rohrbeck and Twentyman (1986) | Revised Conners parent rating scale | 24 | .24 |
| Salzinger, Feldman, Hammer and Rosario (1993) | Child Behavior Checklist | 174 | .30*** |
| Whipple and Webster-Stratton (1991; mothers) | Child Behavior Checklist; Eyberg child behavior inventory | 121 | .31*** |
| Webster-Stratton (1985) | Child Behavior Checklist interview | 40 | .13 |
| Starr (1982) | Questionnaire (this study) | 174 | .05 |
| Smith and Hanson (1975) | Interview | 187 | .07 |
| Timmer, Borrego and Urquiza (2002) | Child Behavior Checklist | 30 | .12 |
| Williamson, Bourduin and Howe (1991) | Revised behavior problem checklist | 23 | .71*** |
| Hamilton, Stiles, Melowsky and Beal (1987) | Questionnaire (this study) | 54 | .45*** |
| Hansen, Pallotta, Tishelman, Conaway and MacMillan (1989) | Eyberg child behavior inventory | 20 | .65** |
| Salzinger, Feldman, Hammer and Rosario (1992) | Child Behavior Checklist | 191 | .27*** |
| Feldman et al. (1995) | Child Behavior Checklist | 166 | .36*** |
| Smith and Alder (1991) | Interview | 90 | .26* |
| Trickett, Aber, Carlson and Cicchetti (1991) | Child Behavior Checklist | 42 | .58*** |
| Reid, Kavanagh and Baldwin (1987) | Becker bi-polar adjective checklist; Child Behavior Checklist | 42 | .40** |
| Trickett (1993) | Child Behavior Checklist | 58 | .47*** |
| Wolfe and Mosk (1983) | Child behavior profile | 70 | .55*** |
| Altemeier, O'Connor, Vietze, Sandler and Sherrod (1982) | Interview | 1400 | .27*** |
| Larrance and Twentyman (1983) | Coded observation | 20 | .39 |
| *Risk factor: unplanned pregnancy* | | | |
| Altemeier et al. (1982) | | 1400 | .24*** |
| Green (1976) | | 90 | .32*** |
| *Risk factor: parent–child relationship* | | | |
| Browne and Saqi (1988) | Observation using: strange situation | 46 | −.44** |
| Crittenden (1988b) | Observation using: strange situation | 51 | −.56*** |
| Crittenden (1985a,b) | Observation using: strange situation | 20 | −.90*** |
| Shipman and Zeman (2001) | Emotion management interview — child version (this study) | 50 | −.43** |
| Burgess and Conger (1978; fathers) | Coded observation using: behavioral observation scoring system | 36 | −.11 |
| Coohey (2000) | Questionnaire (this study) | 70 | −.30* |
| Whipple and Webster-Stratton (1991; fathers) | Coded observation | 85 | −.19 |
| Reid, Taplin and Lorber (1981; fathers) | Coded observation | 35 | −.23 |
| Burgess and Conger (1978; mothers) | Observation using: behavioral observation scoring system | 36 | −.30 |
| Dietrich, Starr and Kaplan (1980) | Observation using: measure of maternal stimulation | 28 | −.31 |
| Cerezo and D'Ocon (1995) | Coded observation using: Standardized Observation Codes 3rd revision | 30 | .12 |
| Christopoulos, Bonvillian and Crittenden (1988) | Coded observation | 20 | −.06 |
| Crittenden and Bonvillian (1984) | Observation: maternal coding device | 20 | −.92*** |

**Table 3** *(continued)*

| Microsystem: parent-child interaction/parent report of child behavior | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: parent–child relationship* | | | |
| Lahey, Conger, Atkeson and Treiber (1984) | Behavior observation | 24 | −.27 |
| Mash et al. (1983) | Behavior observation | 36 | .11 |
| Bousha and Twentyman (1984) | Observation using: interactional language | 24 | −.70*** |
| Schindler and Arkowitz (1986) | Observation using: Patterson system | 23 | −.35 |
| Whipple and Webster-Stratton (1991; mothers) | Coded observation | 120 | −.21* |
| Wasserman, Green and Allen (1983) | Observation using: maternal style scale | 24 | −.17 |
| Webster-Stratton (1985) | Observation using: dyadic parent–child interaction coding system | 40 | −.13 |
| Reid et al. (1981; mothers) | Coded observation | 54 | −.43*** |
| Shipman and Zeman (1999) | Mother–child interaction task | 44 | −.44** |
| Susman, Trickett, Iannotti, Hollenbeck and Zahn-Waxler (1985) | Q-sort: block child rearing practices | 33 | −.39* |
| Starr (1982) | Caldwell's home observation | 174 | −.13 |
| Timmer et al. (2002) | Coded observation | 30 | −.21 |
| Smith and Hanson (1975) | Interview | 187 | −.13 |
| Hyman, Parr and Browne (1979) | Coded observation | 24 | −.27 |
| Kavanagh, Youngblade, Reid and Fagot (1988) | Observation: interactive behavior code | 45 | −.29 |
| Trickett et al. (1991) | Child-Rearing Practices Q-Sort | 42 | −.52*** |
| Trickett and Susman (1988) | Interview | 56 | −.14 |
| Toth and Cicchetti (1996) | Relatedness scales | 58 | .20 |
| Disbrow, Doerr and Caulfield (1977a,1977b) | Coded observation using: Barnard scales | 59 | −.71*** |
| *Risk factor: parent use of corporal punishment* | | | |
| Whipple and Webster-Stratton (1991; fathers) | Parent daily report | 89 | .42*** |
| Smith and Hanson (1975; fathers) | Interview | 187 | .20** |
| Whipple and Webster-Stratton (1991; mothers) | Parent daily report | 114 | .28** |
| Smith and Hanson (1975; mothers) | Interview | 187 | .33*** |
| Trickett and Kuczynski (1986) | Parent daily report | 40 | .17 |
| Trickett and Susman (1988) | Interview | 46 | .20 |
| Webster-Stratton (1985) | Interview | 40 | .16 |
| *Risk factor: parenting behaviors* | | | |
| Lorber, Felton and Reid (1984) | Coded observation | 18 | −.28 |
| Shipman and Zeman (2001) | Emotion management interview | 50 | −.37** |
| Hansen et al. (1989) | Parental problem-solving measure | 20 | −.47* |
| Altemeier et al. (1982) | Interview | 1400 | .02 |
| Azar, Robinson, Hekimian and Twentyman (1984) | Parent opinion questionnaire | 20 | .50* |
| Caselles and Milner (2000) | Questionnaire (this study) | 60 | .41** |
| Spinetta (1978) | Michigan screening profile of parenting | 63 | .50*** |
| Smith and Hanson (1975) | Interview | 187 | .10 |
| Hawkins and Duncan (1985b) | Survey | 276 | .41*** |
| Kravitz and Driscoll (1983) | Vineland Social Maturity Index | 60 | .35** |
| Twentyman and Plotkin (1982) | Developmental Expectation Questionnaire from: Vineland Social Maturity Index | 26 | .49* |
| Corse, Schmid and Trickett (1990) | Child-Rearing Practices Q-Sort | 52 | .24 |
| Melnick and Hurley (1969) | Manifest rejection scale | 20 | −.48* |
| Wasserman et al. (1983) | Observation using: maternal style scale | 24 | .14 |
| Susman et al. (1985) | Q-sort: block child rearing practices report | 33 | .09 |
| Starr (1982) | Questionnaire (this study) | 174 | .05 |
| Webster-Stratton (1985) | Interview | 40 | .08 |
| Letourneau (1981) | Observation using: a role-play inventory | 60 | .59*** |
| Disbrow et al. (1977b) | Questionnaire (this study) | 117 | .38*** |
| Trickett and Kuczynski (1986) | Parent daily report | 40 | .34* |
| Trickett et al. (1991) | Child-Rearing Practices Q-Sort | 42 | .14 |
| Trickett and Susman (1988) | Child-rearing Practices Q-Sort | 46 | .15 |
| Letourneau (1981) | Hogan empathy test; measure of empathetic responsiveness | 60 | −.51*** |

**Table 3** *(continued)*

| Microsystem: parent-child interaction/parent report of child behavior | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: parenting behaviors* | | | |
| Kropp and Haynes (1987) | Questionnaire (this study) | 40 | −.41** |
| Shipman and Zeman (2001) | Emotion management interview — mother version (this study) | 50 | −.61*** |
| Rosenstein (1995) | Adult–adolescent parent inventory | 29 | −.27 |
| Disbrow et al. (1977a,b) | Empathy scales | 59 | −.38** |
| *Risk factor: stress over parenting* | | | |
| Altemeier et al. (1982) | Interview | 1400 | .24*** |
| Graham et al. (2001) | Parenting Stress Index | 47 | .43** |
| Starr (1982) | Questionnaire (this study) | 174 | .06 |
| Timmer et al. (2002) | Parenting Stress Index | 30 | .47** |
| Chan (1994) | Parenting Stress Index | 72 | .32** |
| Trickett and Susman (1988) | Interview | 56 | .34* |
| Caselles and Milner (2000) | Questionnaire (this study) | 60 | −.22 |
| Mash et al. (1983) | Parenting sense of competence scale | 36 | −.51** |
| Rosenberg and Reppucci (1983) | Interview | 24 | −.31 |
| Disbrow et al. (1977b) | Interview | 117 | −.20* |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 59 | .09 |
| Microsystem: parent characteristics independent of child | | | |
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: anger/hyper-reactivity* | | | |
| Shorkey and Armendariz (1985) | Buss-Durkee Hostility Inventory | 36 | .15 |
| Spinetta (1978) | Michigan screening profile of parenting | 63 | .74*** |
| Robyn and Fremouw (1996) | State-trait anger expression inventory | 18 | .10* |
| Bauer and Twentyman (1985) | Questionnaire (this study) | 24 | .48* |
| Bradley and Peters (1991) | Eyberg child behavior inventory | 16 | .16 |
| Frodi and Lamb (1980) | Mood Adjective Checklist | 28 | .38* |
| Friedrich, Tyler and Clark (1985) | Laboratory test | 29 | .24 |
| Disbrow et al. (1977b) | Laboratory test | 117 | .31*** |
| Wolfe and Mosk (1983) | Laboratory test | 14 | .16 |
| *Risk factor: parent anxiety* | | | |
| NSPCC Battered Child Research Team (1976; fathers) | Cattell's sixteen personality factor questionnaire | 16 | .12 |
| Whipple and Webster-Stratton (1991; fathers) | State-trait anxiety inventory | 86 | .17 |
| NSPCC Battered Child Research Team (1976; mothers) | Cattell's sixteen personality factor questionnaire | 24 | .24 |
| Friedrich et al. (1985) | Multiple affect adjective checklist | 29 | .23 |
| Whipple and Webster-Stratton (1991; mothers) | State-trait anxiety inventory | 119 | .21* |
| Webster-Stratton (1985) | State-trait anxiety inventory | 40 | .30 |
| Smith, Hanson and Noble (1973) | International classification of disease | 176 | .39*** |
| Robertson and Juritz (1979) | DSM-II diagnosis | 73 | .34** |
| *Risk factor: psychopathology* | | | |
| Smith et al. (1973; fathers) | DSM-I diagnosis | 113 | .49*** |
| Christensen, Brayden, Dietrich, McLaughlin and Sherrod (1994) | Tennessee self-concept scale | 33 | .17 |
| Estroff et al. (1984) | Brief symptom inventory | 56 | .27* |
| Lahey et al. (1984) | State-trait anxiety inventory; Cornell medical index | 24 | .59* |
| Friedrich et al. (1985) | Mini-Mult | 29 | .20 |
| Williamson et al. (1991) | Symptom checklist-90-revised | 23 | .26 |
| Green, Liang, Gaines and Sultan (1980) | Current and past psychopathology scales | 40 | .11 |
| Smith et al. (1973; mothers) | DSM-I diagnosis | 176 | .61*** |
| Anderson and Lauderdale (1982) | Tennessee self-concept scale | 737 | .36*** |
| Hansen et al. (1989) | Symptom checklist-90-revised | 20 | .40 |
| Kelleher, Chaffin, Hollenberg and Fischer (1994) | Diagnostic interview schedule | 338 | .22*** |
| Chaffin, Kelleher and Hollenberg (1996) | Diagnostic interview schedule | 7015 | .01 |
| Wright (1976) | Rorschach | 26 | .02 |

*(continued on next page)*

**Table 3** *(continued)*

| Microsystem: parent-characteristic independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: depression* | | | |
| Whipple and Webster-Stratton (1991; fathers) | Beck depression inventory | 86 | .03 |
| Culp, Culp, Soulis and Letts (1989) | Center for epidemiologic studies depression scale | 55 | .65*** |
| Chan (1994) | Parenting Stress Index | 72 | .17 |
| Evans (1980) | Measure adapted from MMPI | 40 | .43** |
| Lahey et al. (1984) | Beck depression inventory | 24 | .68** |
| Kinard (1996) | CES-depression scale | 232 | .26*** |
| Mash et al. (1983) | Parenting Stress Index | 36 | .72*** |
| Friedrich et al. (1985) | Multiple affect adjective checklist | 29 | .15 |
| Whipple and Webster-Stratton (1991; mothers) | Beck depression inventory | 119 | .36*** |
| Webster-Stratton (1985) | Beck depression inventory | 40 | .49** |
| Zuravin and Starr (1991) | Beck depression inventory | 142 | .16 |
| Timmer et al. (2002) | Parenting Stress Index | 30 | .47** |
| Kelleher et al. (1994) | Diagnostic interview schedule | 338 | .16** |
| Chaffin et al. (1996) | Diagnostic interview schedule | 7015 | .29*** |
| *Risk factor: self-esteem* | | | |
| Bradley and Peters (1991) | Parental attribution test | 32 | .35* |
| Culp et al. (1989) | Index of self-esteem | 55 | −.42** |
| Christensen et al. (1994) | Tennessee self-concept scale | 33 | −.21 |
| Altemeier et al. (1982) | Interview | 1400 | −.28*** |
| Melnick and Hurley (1969) | California test of personality | 20 | −.48* |
| Shorkey and Armendariz (1985) | Rosenberg self-esteem scale | 36 | −.02 |
| Anderson and Lauderdale (1982) | Tennessee self-concept scale | 737 | −.23*** |
| Hamilton et al. (1987) | Tennessee self-concept scale | 44 | −.51*** |
| Lawson and Hays (1989) | Items from: parent child relations questionnaire; self-description and mate description form | 46 | .25 |
| Williamson et al. (1991) | Interpersonal support evaluation list | 23 | −.54** |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 59 | −.40** |
| *Risk factor: poor relationship with own parents* | | | |
| Altemeier et al. (1982) | Interview | 1400 | .22*** |
| Caliso and Milner (1994) | Childhood social network questionnaire | 52 | .01 |
| Gaines, Sandgrund, Green and Power (1978) | Michigan screening profile of parenting | 160 | .05 |
| Green (1976) | Interview | 90 | .30** |
| Whipple and Webster-Stratton (1991) | Interview | 122 | .29** |
| Spinetta (1978) | Michigan screening profile of parenting | 63 | .57*** |
| Zuravin and Starr (1991) | Michigan screening profile of parenting | 142 | .27** |
| Starr (1982) | Questionnaire (this study) | 174 | .07 |
| Smith and Hanson (1975) | Interview | 187 | .34*** |
| Disbrow et al. (1977b) | Interview | 117 | .22* |
| Wiehe (1992) | Block child rearing practices report | 490 | .23*** |
| *Risk factor: parent experienced childhood abuse* | | | |
| Coohey (2000) | Adapted from: conflict tactics scales | 70 | .14 |
| Smith and Alder (1991; fathers) | Interview | 90 | .24* |
| Altemeier et al. (1982) | Interview | 1400 | .14*** |
| Coohey and Braun (1997) | Items from: conflict tactics scales | 229 | .23*** |
| Altemeier, O'Connor, Sherrod and Tucker (1986) | Interview | 927 | .02 |
| Whipple and Webster-Stratton (1991) | Interview | 123 | .36*** |
| Webster-Stratton (1985) | Interview | 40 | .47** |
| Smith and Alder (1991; mothers) | Interview | 90 | .34** |
| Zuravin and Starr (1991) | Interview | 142 | .09 |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 59 | .59*** |
| Newberger, Hampton, Marx and White (1986) | Interview | 96 | .32** |
| Starr (1982) | Questionnaire (this study) | 174 | .13 |
| Mitchell (1990) | Attachment and support systems questionnaire | 60 | .80*** |
| Smith and Hanson (1975) | Interview | 187 | .19* |
| Conger, Burgess and Barrett (1979) | Item from: survey on bringing up children | 35 | .47** |
| *Risk factor: criminal behavior* | | | |
| Smith et al. (1973; fathers) | Criminal records | 213 | .24* |
| Smith et al. (1973; mothers) | Criminal records | 176 | .21** |

**Table 3** *(continued)*

| Microsystem: parent-characteristic independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: criminal behavior* | | | |
| Starr (1982) | Questionnaire (this study) | 174 | .17* |
| Altemeier et al. (1982) | Interview | 1400 | .26*** |
| *Risk factor: personal stress* | | | |
| Coohey (2000) | Questionnaire (this study) | 70 | .17 |
| Whipple and Webster-Stratton (1991; fathers) | Life experience survey | 84 | .20 |
| Chan (1994) | Parenting Stress Index | 72 | .28* |
| Coohey and Braun (1997) | Items from: social readjustment rating scale | 229 | .13* |
| Gaines et al. (1978) | Schedule of recent experience; family life form | 160 | −.09 |
| Letourneau (1981) | Social readjustment rating scale | 60 | .06 |
| Mash et al. (1983) | Parenting Stress Index | 36 | .51** |
| Newberger, Reed, Daniel, Hyde and Kotelchuck (1977) | Interview | 154 | .21** |
| Whipple and Webster-Stratton (1991; mothers) | Life experience survey | 120 | .44*** |
| Webster-Stratton (1985) | Life experience survey | 40 | .33* |
| Rosenberg and Reppucci (1983) | Social readjustment rating scale | 23 | .57** |
| Williamson et al. (1991) | Hassles scale | 23 | .49* |
| Conger et al. (1979) | Social readjustment rating scale | 40 | .35* |
| Hamilton et al. (1987) | Social readjustment rating scale | 64 | .28* |
| Justice, Calvert and Justice (1985) | Recent life changes questionnaire | 46 | .25 |
| Lawson and Hays (1989) | Recent life changes questionnaire | 46 | .31* |
| Justice and Duncan (1976) | Social readjustment rating scale | 70 | .46*** |
| Smith and Alder (1991) | Interview | 90 | .28** |
| Starr (1982) | Questionnaire (this study) | 174 | .05 |
| NSPCC Battered Child Research Team (1976) | Health visitor questionnaire (this study) | 40 | .34* |
| Smith and Alder (1991) | Interview | 90 | .12 |
| Starr (1982) | Questionnaire (this study) | 174 | .15 |
| Robertson and Juritz (1979) | Interview | 73 | .12 |
| Altemeier et al. (1982) | Interview | 1400 | .05* |
| *Risk factor: social support* | | | |
| Coohey (2000) | Questionnaire (this study) | 70 | −.23 |
| Altemeier et al. (1982) | Interview | 1400 | .02 |
| Chan (1994) | Maternal social support index | 72 | −.31** |
| Coohey and Braun (1997) | Questionnaire (this study) | 229 | −.15* |
| Corse et al. (1975) | Community relationships index; interview; family relationship index | 52 | −.17 |
| Coohey (1996) | Questionnaire (this study) | 195 | .07 |
| Gaudin and Pollane (1983) | Index of social network strength | 98 | −.39*** |
| Mash et al. (1983) | Parenting Stress Index | 36 | −.60*** |
| Lau and Donnan (1987) | Interview | 58 | −.03 |
| Newberger et al. (1977) | Interview | 154 | −.21** |
| Mitchell (1990) | Attachment and support systems questionnaire | 60 | −.36** |
| Zuravin and Starr (1991) | Interview | 142 | −.23** |
| Williamson et al. (1991) | Interpersonal support evaluation list | 23 | −.56** |
| Newberger et al. (1986; mothers) | Interview | 96 | −.19 |
| Smith, Hanson and Noble (1974) | Interview | 175 | −.25*** |
| Chaffin et al. (1996) | Diagnostic interview schedule | 7015 | .01 |
| Disbrow et al. (1977b) | Interview | 117 | −.44*** |
| Starr (1982) | Questionnaire (this study) | 174 | −.08 |
| Smith and Alder (1991) | Interview | 90 | −.14 |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 59 | −.54** |
| *Risk factor: alcohol abuse* | | | |
| Zuravin and Starr (1991) | Interview | 142 | .16 |
| Starr (1982) | Questionnaire (this study) | 174 | .00 |
| Kelleher et al. (1994) | Diagnostic interview schedule | 338 | .26*** |
| *Risk factor: unemployment* | | | |
| Coohey (2000) | | 70 | −.06 |
| Starr (1982; fathers) | | 174 | .22** |
| Crittenden (1988a,b) | | 51 | −.10 |
| Kinard (1995b) | | 231 | .44*** |
| Salzinger et al. (1993) | | 174 | .05 |

**Table 3** *(continued)*

| Microsystem: parent-characteristic independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: unemployment* | | | |
| Starr (1982; mothers) | | 174 | .08 |
| Zuravin (1988) | | 399 | .13** |
| Shipman and Zeman (2001) | | 50 | .07 |
| *Risk factor: coping and problem-solving skills* | | | |
| Cantos, Neale, O'Leary and Gaines (1997) | Problem solving inventory | 33 | −.50** |
| Gaines et al. (1978) | Michigan screening profile of parenting | 160 | −.14 |
| Justice et al. (1985) | Family environment scale; social support system inventory; social information form | 46 | .12 |
| Robyn and Fremouw (1996) | Social problem solving inventory — rev | 18 | −.78 |
| *Risk factor: single parent* | | | |
| Coohey (2000) | | 70 | −.16 |
| Gelles (1989; fathers) | | 1582 | .29*** |
| Connelly and Straus (1992) | | 1997 | −.02 |
| Coohey (1996) | | 195 | .17* |
| Crittenden and DiLalla (1988) | | 43 | .06 |
| Gelles (1989; mothers) | | 1582 | .06* |
| Gaines et al. (1978) | | 160 | .05 |
| Lau and Donnan (1987) | | 58 | .31* |
| Graham et al. (2001) | | 47 | .16 |
| Salzinger et al. (1993) | | 174 | .05 |
| Webster-Stratton (1985) | | 40 | .37* |
| Starr (1982) | | 174 | .10 |
| Finzi, Har-Even and Weizman (2003) | | 76 | .05 |
| Smith et al. (1974) | | 175 | .27*** |
| Timmer et al. (2002) | | 30 | .18 |
| Shipman and Zeman (2001) | | 50 | −.12 |
| Chaffin et al. (1996) | | 7015 | .01 |
| Corey, Miller and Widlak (1975) | | 98 | −.07 |
| Hoffman-Plotkin and Twentyman (1984) | | 28 | −.29 |
| Sack, Mason and Higgins (1985) | | 436 | .11* |
| Whipple and Webster-Stratton (1991) | | 123 | .22* |
| Wolfe and Mosk (1983) | | 70 | .25* |
| *Risk factor: age* | | | |
| NSPCC Battered Child Research Team (1976; fathers) | | 16 | −.47 |
| Lauer, Tenbroeck and Grossman (1974; fathers) | | 243 | −.13* |
| Whipple and Webster-Stratton (1991; fathers) | | 109 | .00 |
| Smith and Alder (1991; fathers) | | 90 | −.23* |
| Fundudis, Kaplan and Dickinson (2003; fathers) | | 48 | −.94*** |
| Connelly and Straus (1992) | | 1997 | −.07** |
| NSPCC Battered Child Research Team (1976; mothers) | | 24 | −.59** |
| DiLalla and Crittenden (1990) | | 79 | −.19* |
| Gaines et al. (1978) | | 160 | −.06 |
| Kinard (1995b) | | 231 | .04 |
| Letourneau (1981) | | 60 | .07 |
| Lau and Donnan (1987) | | 58 | −.03 |
| Friedrich et al. (1985) | | 29 | .30 |
| Graham et al. (2001) | | 47 | .07 |
| Lauer et al. (1974; mothers) | | 243 | −.21*** |
| Salzinger et al. (1993) | | 174 | .05 |
| Whipple and Webster-Stratton (1991; mothers) | | 121 | −.37*** |
| Webster-Stratton (1985) | | 40 | −.18 |
| Smith and Alder (1991; mothers) | | 90 | −.24* |
| Shipman and Zeman (1999) | | 44 | −.02 |
| Zuravin and Starr (1991) | | 152 | .02 |
| Williamson et al. (1991) | | 23 | −.37 |
| Starr (1982) | | 174 | .05 |
| Timmer et al. (2002) | | 30 | .12 |
| Fundudis et al. (2003; mothers) | | 58 | −.95*** |
| Zuravin (1988) | | 399 | −.19*** |
| Shipman and Zeman (2001) | | 50 | −.05 |
| Chaffin et al. (1996) | | 7015 | −.11*** |

**Table 3** *(continued)*

| Microsystem: parent-characteristic independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: age* | | | |
| Hansen et al. (1989) | | 20 | .25 |
| Wiehe (1992) | | 294 | −.07 |
| Robyn and Fremouw (1996) | | 18 | .80*** |
| *Risk factor: drug abuse* | | | |
| Zuravin and Starr (1991) | Interview | 142 | .02 |
| Starr (1982) | Questionnaire (this study) | 174 | .02 |
| Kelleher et al. (1994) | Diagnostic interview schedule | 338 | .14* |
| *Risk factor: health problems* | | | |
| Chan (1994) | Parenting Stress Index | 72 | .12 |
| Starr (1982) | Questionnaire (this study) | 174 | .05 |
| Conger et al. (1979) | Cornell medical index | 40 | .35* |
| *Risk factor: parent gender* | | | |
| Chaffin et al. (1996) | | 7015 | .08*** |
| Wiehe (1992) | | 294 | .05* |
| *Risk factor: approval of corporal punishment* | | | |
| Coohey (2000) | Item from: general social science survey | 70 | .11 |
| Altemeier et al. (1982) | Interview | 1400 | .21*** |
| Newberger et al. (1986) | Interview | 96 | −.11 |
| Kelley, Grace and Elliott (1990) | Treatment evaluation inventory | 62 | .03 |
| Trickett and Susman (1988) | Interview | 46 | −.05 |

| Microsystem: child characteristics, excluding parents | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: child social competence* | | | |
| Kinard (1995a,b) | Child Behavior Checklist; teacher's report form of the child behavior profile | 164 | −.13 |
| Perry et al. (1983) | Developmental profile | 42 | −.51*** |
| Daniel, Hampton and Newberger (1983) | Vineland Social Maturity Index | 32 | −.35* |
| Hoffman-Plotkin and Twentyman (1984) | Child behavior form | 28 | −.53** |
| Haskett and Kistner (1991) | Coded observation | 28 | −.37* |
| Howes and Espinosa (1985) | Coded observation | 52 | −.58*** |
| Klimes-Dougan and Kistner (1990) | Coded observation | 22 | −.19 |
| Frodi and Smetana (1984) | Rothenberg social sensitivity test | 48 | −.10 |
| Salzinger et al. (1993) | Peer ratings | 174 | −.25** |
| Rogosch and Cicchetti (1994) | California child Q-set; teacher's report; teacher's rating scale of child's actual behavior | 86 | −.33** |
| Flisher, Kramer, Hoven and Greenwald (1997) | Instrumental and social competence scale | 665 | −.19*** |
| Trickett (1993) | Child Behavior Checklist | 58 | −.23 |
| Toth and Cicchetti (1996) | Self-perception profile for children | 58 | −.28* |
| Wolfe and Mosk (1983) | Child behavior profile | 70 | −.50*** |
| *Risk factor: child externalizing behavior* | | | |
| Bousha and Twentyman (1984) | Observation using: interactional language | 24 | .64*** |
| George and Main (1979) | Coded observation | 20 | .42 |
| Kinard (1995a,b) | Teacher's report form of the child behavior profile | 164 | .09 |
| Williamson et al. (1991) | Revised behavior problem checklist | 23 | .64*** |
| Green (1976) | Interview | 90 | .51*** |
| de Paul and Arruabarrena (1995) | Teacher's report form of child behavior profile | 41 | .29 |
| Jacobson and Straker (1982) | Coded observation | 57 | .18 |
| Hoffman-Plotkin and Twentyman (1984) | Coded observation; child behavior form | 28 | .39* |
| Haskett and Kistner (1991) | Coded observation | 28 | .42* |
| Reidy, Anderegg, Tracy and Colter (1980) | Behavior problem checklist | 40 | .48** |
| Salzinger et al. (1993) | Self and peer ratings: teachers report form of child behavior profile | 174 | .20** |
| Prino and Peyrot (1994) | Pittsburgh adjustment survey scale | 42 | .69*** |
| Toth, Manly and Cicchetti (1992) | Child Behavior Checklist | 118 | .12 |
| Howes and Eldredge (1985) | Coded observation | 18 | .72** |

*(continued on next page)*

**Table 3** *(continued)*

| Microsystem: child characteristics, excluding parents | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: child externalizing behavior* | | | |
| Rohrbeck and Twentyman (1986) | Conners teacher rating scale | 24 | .15 |
| Milner and Robertson (1990) | Child abuse potential inventory | 60 | .42*** |
| Lynch and Cicchetti (1998) | Child Behavior Checklist; checklist of child distress symptoms | 206 | .12 |
| Salzinger et al. (1992) | Teacher's report form of the child behavior profile | 191 | .16* |
| Feldman et al. (1995) | Teacher's report form of the child behavior profile | 166 | .27*** |
| Rogosch and Cicchetti (1994) | California child Q-set; teacher's report form of child behavior profile; teacher's rating scale of child's actual behavior | 86 | .38*** |
| Waldinger et al. (2001) | Coded observation using: core conflictual relationship theme method | 49 | .89*** |
| Flisher et al. (1997) | Diagnostic interview schedule for children | 665 | .14*** |
| Toth and Cicchetti (1996) | Self-perception profile for children | 58 | .21 |
| Reid et al. (1987) | Coded observation | 42 | .10 |
| Crittenden (1988b) | Coded observation | 51 | .13 |
| Mash et al. (1983) | Parenting Stress Index | 36 | .50** |
| Newberger et al. (1986) | Infant scales | 96 | .22* |
| Schindler and Arkowitz (1986) | Observation using: Patterson system | 23 | .45* |
| Webster-Stratton (1985) | Observation using: dyadic parent–child interaction coding system | 40 | .28 |
| Trickett and Kuczynski (1986) | Parent daily report | 40 | .53*** |
| Starr (1982) | Questionnaire (this study) | 174 | −.04 |
| *Risk factor: child internalizing behavior* | | | |
| Kinard (1995a,b) | Teacher's report form of the child behavior profile | 164 | .15 |
| Chan (1994) | Parenting Stress Index | 72 | .26* |
| Mash et al. (1983) | Child Behavior Checklist | 36 | .60*** |
| Rohrbeck and Twentyman (1986) | Conners teacher rating scale; revised Conners parent rating scale | 24 | .14 |
| Webster-Stratton (1985) | Child Behavior Checklist | 40 | .19 |
| Williamson et al. (1991) | Revised behavior problem checklist | 23 | .20 |
| Timmer et al. (2002) | Child Behavior Checklist | 30 | .12 |
| de Paul and Arruabarrena (1995) | Teacher's report form of the child behavior profile | 41 | .21 |
| Jacobson and Straker (1982) | Coded observation | 57 | .45*** |
| Haskett and Kistner (1991) | Preschool behavior questionnaire | 28 | .31 |
| Lynch and Cicchetti (1998) | Child Behavior Checklist; checklist of child distress symptoms | 206 | .09 |
| Reidy et al. (1980) | California child Q-set; behavior problem checklist | 40 | .26 |
| Feldman et al. (1995) | Teacher's report form of the child behavior profile | 166 | .22** |
| Salzinger et al. (1993) | Self and peer ratings | 174 | −.02 |
| Rogosch and Cicchetti (1994) | California child Q-set; teacher's report form of child behavior profile; teacher's rating scale of child's actual behavior | 86 | .07 |
| Trickett et al. (1991) | Child Behavior Checklist | 42 | .48** |
| Prino and Peyrot (1994) | Pittsburgh adjustment survey scale | 42 | −.12 |
| Flisher et al. (1997) | Diagnostic interview schedule for children | 665 | .10** |
| Wolfe and Mosk (1983) | Child behavior profile | 70 | .34** |
| Toth et al. (1992) | Children's depression inventory | 118 | .02 |
| Trickett (1993) | Child Behavior Checklist | 58 | .52*** |
| Toth and Cicchetti (1996) | Children's depression inventory | 58 | −.01 |
| Reid et al. (1987) | Child Behavior Checklist | 42 | .10 |
| *Risk factor: child gender* | | | |
| Crittenden (1988a,b) | | 51 | .20 |
| DiLalla and Crittenden (1990) | | 79 | −.08 |
| Lau and Donnan (1987) | | 58 | .14 |
| Williamson et al. (1991) | | 24 | .08 |
| Timmer et al. (2002) | | 30 | .07 |
| Corey et al. (1975) | | 95 | .02 |
| Cohen, Brown and Smailes (2001) | | 607 | .13** |
| Dubowitz, Hampton, Bithoney and Newberger (1987) | | 115 | .06 |

**Table 3** *(continued)*

| Microsystem: child characteristics, excluding parents | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: child gender* | | | |
| Bolger and Patterson (2001) | | 214 | .01 |
| Lauer et al. (1974) | | 243 | −.01 |
| Whipple and Webster-Stratton (1991) | | 123 | .10 |
| Webster-Stratton (1985) | | 40 | .14 |
| Ten Bensel and Baxon (1973) | | 20 | −.20 |
| *Risk factor: child pre- or neonatal problems* | | | |
| Crittenden (1988a,b) | Interview | 51 | −.17 |
| Lynch (1975) | Hospital records | 60 | .45*** |
| Lau and Donnan (1987) | Interview | 58 | .09 |
| Perry et al. (1983) | Questionnaire (this study) | 42 | .09 |
| Starr (1982) | Questionnaire (this study) | 174 | −.03 |
| Corey et al. (1975) | Hospital records | 98 | .01 |
| Smith and Alder (1991) | Interview | 90 | .00 |
| Flisher et al. (1997) | Diagnostic interview schedule for children | 665 | .06 |
| Ten Bensel and Baxton (1973) | Hospital records | 20 | .00 |
| Starr (1988) | Hospital records | 174 | −.02 |
| *Risk factor: child disability* | | | |
| Crittenden (1988a,b) | Interview | 51 | .09 |
| Lau and Donnan (1987) | Interview | 58 | .00 |
| Perry et al. (1983) | Questionnaire (this study) | 42 | .08 |
| Starr (1982) | Questionnaire (this study) | 174 | −.03 |
| *Risk factor: child age* | | | |
| Connelly and Straus (1992) | | 1997 | −.03 |
| Crittenden (1988a,b) | | 51 | −.30* |
| During and McMahon (1991) | | 46 | −.14 |
| Crittenden and DiLalla (1988) | | 43 | .02 |
| DiLalla and Crittenden (1990) | | 79 | .08 |
| Friedrich et al. (1985) | | 29 | .27 |
| Williamson et al. (1991) | | 23 | −.20 |
| Hansen et al. (1989) | | 20 | .23 |
| Hoffman-Plotkin and Twentyman (1984) | | 28 | −.08 |
| Whipple and Webster-Stratton (1991) | | 123 | .00 |
| Webster-Stratton (1985) | | 40 | −.08 |
| Flisher et al. (1997) | | 665 | .00 |
| Wolfe and Mosk (1983) | | 70 | −.20 |
| Toth et al. (1992) | | 118 | .01 |

| Microsystem: family factors | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: family conflict* | | | |
| Evans (1980) | Family concept inventory | 40 | .52*** |
| Davis and Graybill (1983) | Moos family environment scale | 30 | .28 |
| Howes, Cicchetti, Toth and Rogosch (2000) | Coded observation | 42 | .05 |
| Trickett et al. (1991) | Family environment scale | 42 | .52*** |
| Silber, Bermann, Henderson and Lehmen (1993) | Coded observation | 16 | .82*** |
| *Risk factor: family cohesion* | | | |
| Williamson et al. (1991) | Family adaptability and cohesion evaluation scales-II | 23 | −.36 |
| Davis and Graybill (1983) | Moos family environment scale | 30 | −.24 |
| Justice and Calvert (1990) | Family environment scale | 46 | −.44** |
| Howes et al. (2000) | Coded observation | 42 | −.15 |
| Trickett et al. (1991) | Family environment scale | 42 | −.42** |
| *Risk factor: spousal violence* | | | |
| Coohey and Braun (1997) | Items from: conflict tactics scales | 229 | .13* |
| Green (1976) | Interview | 90 | .23* |
| Starr (1982) | Questionnaire (this study) | 174 | .20** |
| Smith and Alder (1991) | Interview | 90 | .22* |
| Cox, Kotch and Everson (2003) | Questionnaire (this study) | 190 | .39*** |
| *Risk factor: marital satisfaction* | | | |
| Whipple and Webster-Stratton (1991; fathers) | Marital adjustment test | 82 | −.06 |
| Chan (1994) | Parenting Stress Index | 72 | −.20 |
| Lau and Donnan (1987) | Interview | 58 | −.17 |
| Robertson and Juritz (1979) | Interview | 73 | −.44*** |

**Table 3** *(continued)*

| Microsystem: family factors | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: marital satisfaction* | | | |
| Whipple and Webster-Stratton (1991; mothers) | Marital adjustment test | 91 | −.26* |
| Green (1976) | Interview | 90 | −.14 |
| Starr (1982) | Questionnaire (this study) | 174 | .03 |
| Smith et al. (1974) | Interview | 290 | −.21*** |
| *Risk factor: family size* | | | |
| Coohey (2000) | | 70 | .23* |
| Connelly and Straus (1992) | | 1997 | .12*** |
| Chan (1994) | | 72 | .29* |
| Crittenden (1988a,b) | | 51 | .21 |
| Coohey (1996) | | 195 | .05 |
| DiLalla and Crittenden (1990) | | 79 | .00 |
| Letourneau (1981) | | 60 | −.03 |
| Friedrich et al. (1985) | | 29 | .43* |
| Graham et al. (2001) | | 47 | .38** |
| Salzinger et al. (1993) | | 174 | .05 |
| Webster-Stratton (1985) | | 40 | .00 |
| Shipman and Zeman (1999) | | 44 | .10 |
| Zuravin and Starr (1991) | | 142 | .31*** |
| Williamson et al. (1991) | | 23 | .31 |
| Smith et al. (1974) | | 187 | .21** |
| Chaffin et al. (1996) | | 7015 | .13*** |
| Hansen et al. (1989) | | 20 | −.13 |
| Manly, Cicchetti and Barnett (1994) | | 162 | .34*** |
| Wolfe and Mosk (1983) | | 70 | −.08 |
| Toth et al. (1992) | | 118 | .04 |
| Trickett and Susman (1988) | | 56 | .09 |
| Starr (1982) | | 174 | .05 |
| Zuravin (1988) | | 399 | .39*** |
| *Risk factor: socio-economic status* | | | |
| Webster-Stratton (1985) | | 40 | −.27 |
| Chaffin et al. (1996) | | 7015 | .01 |
| Whipple and Webster-Stratton (1991) | | 123 | −.49*** |
| Smith et al. (1973) | | 170 | −.25*** |
| Price and Glad (2003) | | 75 | −.26* |
| Smith et al. (1974) | | 91 | −.31** |
| Connelly and Straus (1992) | | 1997 | −.04* |
| Crittenden (1988a,b) | | 51 | −.19 |
| Coohey (1996) | | 195 | −.13 |
| Kinard (1995b) | | 231 | −.29*** |
| Graham et al. (2001) | | 47 | −.37** |
| Webster-Stratton (1985) | | 40 | −.45** |
| Letourneau (1981) | | 60 | −.21 |
| Hansen et al. (1989) | | 20 | −.32 |
| Hoffman-Plotkin and Twentyman (1984) | | 28 | −.08 |
| Gaines et al. (1978) | | 160 | −.15 |
| Howes and Eldredge (1985) | | 18 | −.18 |
| *Risk factor: non-biological parent* | | | |
| Coohey (2000) | | 70 | −.19 |
| Starr (1982) | | 174 | −.02 |
| Lau and Donnan (1987) | | 58 | .13 |

*$p<0.05$, **$p<0.01$, ***$p<0.005$.

mean effect size is $r=.22$. Large effect sizes were found between child physical abuse and three risk factors (parent anger/hyper-reactivity, family conflict and family cohesion). Fifteen moderate effect sizes and fifteen small, but significant effect sizes were also calculated between child physical abuse and risk factors. Seven effect sizes were found to be insignificant (i.e., parent health problems, approval of corporal punishment, child gender, prenatal or neonatal problems, disability and age, and non-biological parent in home).

Large effect sizes were found between child neglect and five risk factors (parent–child relationship, parent perceives child as problem, parent level of stress, parent anger/hyper-reactivity, and parent self-esteem). Six moderate effect sizes and nine small but significant effect

**Table 4**
Study, measure, sample size and effect sizes for each study used to calculate composite effect sizes for child neglect

| Microsystem: parent-child interaction/parent report of child behavior | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: parent–child relationship* | | | |
| Burgess and Conger (1978; fathers) | Observation using: behavioral observation scoring system | 36 | −.43** |
| Burgess and Conger (1978; mothers) | Observation using: behavioral observation scoring system | 36 | −.22 |
| Christopoulos et al. (1988) | Coded observation | 20 | −.35 |
| Crittenden and Bonvillian (1984) | Observation using: maternal coding device | 20 | −.97*** |
| Fagan and Dore (1993) | Parent/caregiver involvement scale | 27 | −.30 |
| Lacharite et al. (1996) | Parenting Stress Index/short form | 48 | −.54*** |
| Bousha and Twentyman (1984) | Observation using: interactional language | 24 | −.74*** |
| Toth and Cicchetti (1996) | Relatedness scales | 59 | −.21 |
| Disbrow et al. (1977a,b) | Coded observation using: Barnard scales | 61 | −.61*** |
| Crittenden (1988b) | Coded observation | 49 | −.50*** |
| Crittenden (1985a,b) | Coded observation | 20 | −.90*** |
| *Risk factor: parent perceives child as problem* | | | |
| Rohrbeck and Twentyman (1986) | Revised Conners parent rating scale | 24 | .42* |
| Hansen et al. (1989) | Eyberg child behavior inventory | 20 | .29 |
| Williamson et al. (1991) | Revised behavior problem checklist | 23 | .69*** |
| Larrance and Twentyman (1983) | Interview | 20 | .24 |
| *Risk factor: parenting behaviors* | | | |
| Azar et al. (1984) | Parent Problem Solving Instrument | 20 | −.49* |
| Hansen et al. (1989) | Parental problem-solving measure | 20 | −.46* |
| Azar et al. (1984) | Parent opinion questionnaire | 20 | .70*** |
| Jones and McNeely (1980) | Questionnaire (this study) | 58 | .24 |
| Spinetta (1978) | Michigan screening profile of parenting | 65 | .35** |
| Hawkins and Duncan (1985b) | Survey | 647 | .14*** |
| Twentyman and Plotkin (1982) | Developmental Expectation Questionnaire from: Vineland Social Maturity Index | 27 | .54** |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 61 | .27* |
| Disbrow et al. (1977b) | Interview, coded observation using Barnard scales; questionnaire | 118 | .44*** |
| *Risk factor: stress over parenting* | | | |
| Ethier, Lacharite and Couture (1995) | Parental stress index | 80 | .47*** |
| Lacharite et al. (1996) | Parental stress index short form | 48 | .54*** |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 61 | .09 |
| Disbrow et al. (1977b) | Interview, coded observation using Barnard scales, questionnaire | 118 | −.31*** |

| Microsystem: parent characteristics independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: personal stress* | | | |
| Gaudin, Polansky, Kilpatrick and Shilton (1993) | Checklist of stressful life events | 203 | .52*** |
| Gaines et al. (1978) | Schedule of recent experience family life form (this study) | 160 | .13 |
| Williamson et al. (1991) | Hassles scale | 23 | .73*** |
| *Risk factor: anger/hyper-reactivity* | | | |
| *Friedrich et al. (1985) | Multiple affect adjective checklist | 28 | .42* |
| Spinetta (1978) | Michigan screening profile on parenting | 65 | .67*** |
| Disbrow (1977b) | Interview, coded observation using Barnard scale, questionnaire | 118 | .20* |
| *Risk factor: self-esteem* | | | |
| Christensen et al. (1994) | Tennessee self-concept scale | 44 | −.34* |
| Culp et al. (1989) | Index of self-esteem | 56 | −.27* |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 61 | −.29* |
| Williamson et al. (1991) | Interpersonal support evaluation list | 23 | −.55** |

*(continued on next page)*

**Table 4** *(continued)*

| Microsystem: parent characteristics independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: psychopathology* | | | |
| Christensen et al. (1994) | Tennessee self-concept scale | 44 | .27 |
| Estroff et al. (1984) | Brief symptom inventory | 43 | −.01 |
| Friedrich et al. (1985) | Mini-Mult | 28 | .32 |
| Williamson et al. (1991) | Symptom checklist-90-revised | 23 | .31 |
| Green et al. (1980) | Current and past psychopathology scales | 40 | .05 |
| Hansen et al. (1989) | Symptom checklist-90-revised | 20 | .21 |
| Kelleher et al. (1994) | Diagnostic interview schedule | 418 | .36*** |
| Chaffin et al. (1996) | Diagnostic interview schedule | 7036 | .15*** |
| *Risk factor: unemployment* | | | |
| Crittenden (1988a,b) | | 49 | .10 |
| Kinard (1995b) | | 232 | .40*** |
| Sherrod, O'Connor, Vietze and Altemeier (1984) | | 38 | .24 |
| Zuravin (1988) | | 400 | .18*** |
| *Risk factor: depression* | | | |
| Culp et al. (1989) | Center for epidemiologic studies depression scale | 56 | .51*** |
| Ethier et al. (1995) | Beck depression inventory | 80 | .22* |
| Gaudin et al. (1993) | Hudson's generalized contentment scale | 205 | .30*** |
| Kinard (1996) | CES-depression scale | 232 | .26*** |
| Friedrich et al. (1985) | Multiple affect adjective checklist | 28 | .36 |
| Zuravin and Starr (1991) | Beck depression inventory | 152 | .27*** |
| Kelleher et al. (1994) | Diagnostic interview schedule | 418 | .10* |
| Chaffin et al. (1996) | Diagnostic interview schedule | 7036 | .16*** |
| *Risk factor: poor relationship with own parents* | | | |
| Polansky, Chalmers, Buttenwieser and Williiams (1981) | Interview | 125 | .35*** |
| Coohey (1995) | Questionnaire (this study) | 175 | .15* |
| Gaines et al. (1978) | Michigan screening profile of parenting | 160 | .04 |
| Green (1976) | Interview | 60 | .15 |
| Spinetta (1978) | Michigan screening profile of parenting | 65 | .46*** |
| Zuravin and Starr (1991) | Interview | 152 | .12 |
| Disbrow et al. (1977b) | Interview | 118 | .37*** |
| *Risk factor: social support* | | | |
| Polansky et al. (1981; fathers) | Interview | 72 | −.30** |
| Coohey (1996) | Questionnaire (this study) | 219 | −.21** |
| Gaudin et al. (1993) | Social network map | 205 | −.18* |
| Jones and McNeely (1980) | Questionnaire (this study) | 58 | −.17 |
| Polansky et al. (1981) | Interview | 306 | −.10 |
| Zuravin and Starr (1991) | Interview | 152 | −.16* |
| Williamson et al. (1991) | Interpersonal support evaluation list | 23 | −.76*** |
| Polansky et al. (1981; mothers) | Interview | 125 | −.29*** |
| Newberger et al. (1986) | Interview | 82 | .19 |
| Chaffin et al. (1996) | Diagnostic interview schedule | 7036 | .01 |
| Disbrow et al. (1977b) | Interview | 118 | −.47*** |
| Polansky et al. (1981) | Interview | 125 | −.29*** |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 61 | −.37** |
| *Risk factor: parent experienced childhood abuse* | | | |
| Polansky et al. (1981; fathers) | Interview | 72 | −.06 |
| Polansky et al. (1981; mothers) | Interview | 125 | .45*** |
| Altemeier et al. (1986) | Interview | 927 | .02 |
| Ethier et al. (1995) | Psychosocial interview | 80 | .23* |
| Zuravin and Starr (1991) | Interview | 152 | .16* |
| Disbrow et al. (1977a,b) | Questionnaire (this study) | 61 | .37** |
| *Risk factor: age* | | | |
| DiLalla and Crittenden (1990) | | 69 | −.15 |
| Gaines et al. (1978) | | 160 | −.03 |
| Kinard (1995b) | | 232 | .04 |
| Friedrich et al. (1985) | | 28 | .21 |
| Zuravin and Starr (1991) | | 152 | −.04 |
| Williamson et al. (1991) | | 23 | −.03 |
| Zuravin (1988) | | 400 | −.26*** |
| Chaffin et al. (1996) | | 7036 | −.17*** |
| Hansen et al. (1989) | | 20 | .23 |

**Table 4** *(continued)*

| Microsystem: parent characteristics independent of child | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: single parent* | | | |
| Coohey (1996) | | 219 | −.03 |
| Crittenden and DiLalla (1988) | | 45 | .37* |
| Fagan and Dore (1993) | | 27 | .11 |
| Gaines et al. (1978) | | 160 | .05 |
| Sherrod et al. (1984) | | 38 | .42** |
| Finzi et al. (2003) | | 73 | .19 |
| Chaffin et al. (1996) | | 7036 | .03* |
| Hoffman-Plotkin and Twentyman (1984) | | 28 | .08 |
| Polansky et al. (1979) | | 125 | .16 |
| Microsystem: child characteristics, excluding parents | | | |
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: child social competence* | | | |
| Newberger et al. (1986) | Vineland Social Maturity Index | 82 | −.29** |
| Kinard (1999) | Child Behavior Checklist | 232 | −.31*** |
| Hoffman-Plotkin and Twentyman (1984) | Child behavior form | 28 | −.53** |
| Howes and Espinosa (1985) | Coded observation | 52 | −.79*** |
| Frodi and Smetana (1984) | Rothenberg social sensitivity test | 52 | −.09 |
| Rogosch and Cicchetti (1994) | CA child Q-set; teacher's form of child behavior profile | 79 | −.25* |
| Toth and Cicchetti (1996) | Self-perception profile for children | 59 | −.22 |
| *Risk factor: child externalizing behaviors* | | | |
| Bousha and Twentyman (1984) | Observation using: interactional language | 24 | .53** |
| Williamson et al. (1991) | Revised behavior problem checklist | 23 | .67*** |
| Green (1976) | Interview | 60 | .42*** |
| de Paul and Arruabarrena (1995) | Teacher's report form of the child behavior profile | 49 | .33* |
| Hoffman-Plotkin and Twentyman (1984) | Coded observation; child behavior form | 28 | .21 |
| Reidy et al. (1980) | Behavior problem checklist | 36 | .43** |
| Prino and Peyrot (1994) | Pittsburgh adjustment survey scale | 47 | −.17 |
| Toth et al. (1992) | Child Behavior Checklist | 107 | .18 |
| Rohrbeck and Twentyman (1986) | Conners teacher rating scale | 24 | .30 |
| de Paul and Arruabarrena (1995) | Teacher's report form of the child behavior profile | 49 | .46*** |
| Milner and Robertson (1990) | Child abuse potential inventory | 60 | .28* |
| Lynch and Cicchetti (1998) | Child Behavior Checklist; checklist of child distress; Levonn measure | 200 | .07 |
| Reyome (1993) | Child Behavior Checklist | 63 | .15 |
| Rogosch and Cicchetti (1994) | California child Q-set; teacher's report form of child behavior profile; teacher's rating scale of child's actual behavior | 79 | .09 |
| Toth and Cicchetti (1996) | Self-perception profile for children | 59 | .12 |
| Crittenden (1988b) | Coded observation | 49 | .17 |
| Lacharite et al. (1996) | Parenting Stress Index/short form | 48 | .55*** |
| *Risk factor: child internalizing behavior* | | | |
| Kinard (1995b) | Harter dimensions of depression profile for children | 232 | −.04 |
| Rohrbeck and Twentyman (1986) | Conners teacher rating scale; revised Conners parent rating scale | 24 | .36 |
| Williamson et al. (1991) | Revised behavior problem checklist | 23 | .18 |
| de Paul and Arruabarrena (1995) | Teacher's report form of the child behavior profile | 49 | .15 |
| Lynch and Cicchetti (1998) | Child Behavior Checklist; checklist of child distress symptoms | 200 | .08 |
| Reyome (1993) | Child Behavior Checklist | 66 | .29* |
| Reidy et al. (1980) | California child Q-set; behavior problem checklist | 36 | .11 |
| Rogosch and Cicchetti (1994) | California child Q-set; teacher's report form of child behavior profile; teacher's rating scale of child's actual behavior | 79 | .08 |
| Prino and Peyrot (1994) | Pittsburgh adjustment survey scale | 47 | .81*** |
| Toth et al. (1992) | Children's depression inventory | 107 | −.05 |
| Toth and Cicchetti (1996) | Children's depression inventory | 59 | .10 |
| *Risk factor: child gender* | | | |
| Crittenden (1988a,b) | | 49 | .06 |

**Table 4** *(continued)*

| Microsystem: child characteristics, excluding parents | | | |
|---|---|---|---|
| Study | Measure | *N* | Effect (*r*) |
| *Risk factor: child gender* | | | |
| DiLalla and Crittenden (1990) | | 69 | .03 |
| Williamson et al. (1991) *n*=23 | | 23 | −.02 |
| Cohen et al. (2001) *n*=606 | | 606 | −.03 |
| Bolger and Patterson (2001) *n*=214 | | 214 | .02 |
| *Risk factor: child age* | | | |
| Crittenden (1988a,b) | | 49 | −.38** |
| Crittenden and DiLalla (1988) | | 45 | −.18 |
| DiLalla and Crittenden (1990) | | 69 | −.05 |
| Friedrich et al. (1985) | | 28 | .08 |
| Williamson et al. (1991) | | 23 | .04 |
| Hansen et al. (1989) | | 20 | .30 |
| Hoffman-Plotkin and Twentyman (1984) | | 28 | .00 |
| Toth et al. (1992) | | 107 | .17 |
| Microsystem: family factors | | | |
| Risk factor | Measure | *N* | Effect (*r*) |
| *Family size* | | | |
| Crittenden (1988a,b) | | 49 | .00 |
| Coohey (1996) | | 219 | .05 |
| DilLalla and Crittenden (1990) | | 69 | .17 |
| Friedrich et al. (1985) | | 28 | .41* |
| Polansky et al. (1985) | | 306 | .26*** |
| Zuravin and Starr (1991) | | 152 | .45*** |
| Williamson et al. (1991) | | 23 | .18 |
| Chaffin et al. (1996) | | 7036 | .13*** |
| Hansen et al. (1989) | | 20 | −.04 |
| Manly et al. (1994) | | 137 | .11 |
| Toth et al. (1992) | | 107 | .22* |
| Zuravin (1988) | | 400 | .55*** |
| *Socio-economic status* | | | |
| Crittenden (1988a,b) | | 49 | −.39** |
| Polansky et al. (1985) | | 153 | −.10 |
| Coohey (1996) | | 219 | −.04 |
| Kinard (1995b) | | 232 | −.48*** |
| Gaines et al. (1978) | | 160 | −.06 |
| Hansen et al. (1989) | | 20 | −.18 |
| Hoffman-Plotkin and Twentyman (1984) | | 28 | .00 |
| Howes and Eldredge (1985) | | 8 | −.13 |
| Chaffin et al. (1996) | | 7036 | −.16*** |
| Price and Glad (2003) | | 81 | −.42*** |

*$p<0.05$, **$p<0.01$, ***$p<0.005$.

sizes were also calculated. Two effect sizes were found to be insignificant in relationship to child neglect (i.e., child gender and child age).

## 6. Discussion

This study was guided by Bronfenbrenner's (1979) ecological theory. We predicted that variables within the parent–child interaction and/or parent's report of child behavior level of the microsystem would be most proximal to the issue of child maltreatment and would have the strongest effect sizes. In fact, the two strongest risk factors for neglect (parent child relationships and parent perception of child as problem) were from this level. However, the strongest effect sizes for child physical abuse were parent factors independent of child (parent anger/hyper-reactivity) and family factors (high family conflict and low family cohesion) which we had predicted would be most distal from the abuse. These results provide support for the importance of examining child maltreatment from a multi-factoral perspective. Clearly, studying or intervening to prevent or treat child maltreatment must include risk factors at each level of the macrosystem.

Furthermore, we found that many of the same risk factors were associated with child physical abuse as with neglect. Parent perception of the child as a problem and parent anger/hyper-reactivity were important risk factors for physical abuse and for neglect. The quality of the parent–child relationship was a strongly related factor in neglect and a moderately related factor in physical abuse. Child social competence was moderately related to child neglect and to child physical abuse. Child age and gender were not found to be significantly related to either form of maltreatment, and parent age was also found to have a small relationship to each form of maltreatment.

However, there were differences in which factors were most strongly related to neglect and child physical abuse. For example, risk factors strongly related to neglect but not strongly related to physical abuse included factors pertaining perhaps to personal adequacy, competency, or resilience (i.e., parent self-esteem and stress). In the same vein, parent unemployment and family size were both moderately related to neglect and only minimally related to child physical abuse. Thus, it appears that the phenomena of child neglect may be different from child physical abuse and deserves its own investigation into cause and treatment. Currently, considerably more research has gone into understanding child physical abuse than in understanding child neglect.

The results of this meta-analysis also illustrate which variables are most strongly related to child physical abuse and neglect throughout the literature as a whole. It is interesting to note that the most frequently studied parent-related risk factors in child physical abuse pertain to factors such as parent stress, parent social support, and single parenthood. This meta-analysis, however, showed some less frequently studied factors (e.g., parent anger/hyper-reactivity, anxiety, and psychopathology) to be more strongly related than these to physical abuse. An exception to this is that parent perception of the child as a problem is frequently studied as well as important risk factor for both physical abuse and neglect. Although child misbehavior (i.e., externalizing behaviors) is a popular topic of study relating to both child physical abuse and child neglect, maltreatment is more strongly related to the *perceptions* of the parent regarding the child's behavior than to other indicators of child behavior. Furthermore, only three child factors were significantly related to abuse or neglect (i.e., child social competence, child externalizing behavior, and child internalizing behavior). However, it is important to note that the direction of causality is uncertain.

### 6.1. Limitations

This meta-analysis is subject to a number of limitations that should be considered when interpreting the results. First, it is impossible to include every source of relevant data on each of the risk factors considered. As a result, studies that would have dramatically influenced the results may have been overlooked. Because of the volume of literature on the subject of child maltreatment and the infeasibility of searching multiple databases and sources, only the foremost database on the subject was searched (PsychINFO). This search was also supplemented by searches of the references of several large literature reviews on the subject and of the references of the studies reviewed in this meta-analysis. However, some studies were likely excluded because they were cited in other databases or sources that were not searched. Some potentially relevant studies that were found through the database search were published in obscure sources or were otherwise unable to be obtained. In addition, we did not include unpublished dissertations in our data set. Some relevant studies were omitted because the results could not be converted to effect sizes. Furthermore, a number of the largest effect sizes were obtained with relatively few studies. For example, only two effect sizes were used to calculate unplanned pregnancy which had a strong effect size. Effect sizes based on smaller samples or smaller numbers of studies are at greater risk for bias due to omission. Furthermore, there exists the possibility of "file drawer bias"

that suggests studies that do not find significant results are less likely to be submitted for publication (Hunter & Schmidt, 1990).

A second limitation of this study pertains to the construction and definition of risk factors examined in the study. It is likely that the study variables actually encompass one or more mediating variables or overlap with one another. A measure of homogeneity, $Q^w$, was calculated for each of the study variables. For many of the variables, the measure indicates significantly more variability in results across studies than would be expected to occur by chance. In addition, some of the variables are likely to be correlated (such as depression, anxiety and psychopathology). Some overlap exists in the definitions of the constructs examined in the literature, and this is reflected in overlap in the definitions of the factors examined in this study. It is also likely that the significant $Q^w$ is a result of varying research methodologies and sample populations. The lack of homogeneity within most of the data sets further illustrates the complexity of child maltreatment. In addition, in some of the studies included in this review, the factors examined were considered outcomes of maltreatment by the original authors. For example, it is possible that child externalizing and internalizing behaviors are outcomes of child abuse, rather than risk factors for abuse. Of course, one cannot determine causation in a non-experimental review of the literature. It is important to recognize that this review was only able to examine the relationship between the various factors and child abuse or neglect, but was not able to determine the direction of causality.

Third, there is considerable variability among studies in how child physical abuse and neglect are defined and measured. For example, some studies rely upon self-report questionnaires or interviews, while other studies rely upon clinical or Child Protective Services assessment and classification. Also, some studies report categorical data and others continuous data. While it is generally considered more appropriate to calculate an odds ratio rather than a *d* or *r* when using categorical data, we chose to use a common metric to be able to calculate composite effect sizes and compare effect sizes. This variability in data is a limitation in meta-analyses. There is also a difference between physical abuse and neglect in what risk factors are most commonly studied. This is manifested, for example, in that most of the strongest effect sizes for physical abuse could not be computed for neglect because of an insufficient number of studies examining that risk factor. Since a meta-analysis can only compare the importance of factors that have been studied in the empirical research, caution should be taken when interpreting the strengths of these relationships relative to one another.

Finally, the vast majority of research in child maltreatment fails to distinguish actual abusers from non-offending caregivers. The bulk of the literature is biased toward viewing mothers as the abusers. All but a very small proportion of studies include only mothers in their samples. Research on abusive and neglectful fathers is rare. Furthermore, most studies do not make the distinction between parents of abused children and abusive parents, even when the sample contains both. In fact, many studies assume the mother to be the abuser when child abuse is present in the family. In many cases of child neglect, both parents may reasonably be considered offenders for failing to provide for the needs and safety of the child. However, in most cases only the mother is classified as the abuser. Furthermore, some studies classify mothers of physically abused children as abusers merely on the grounds that the mother did not prevent the father from physically harming the child. As a result of this bias in the literature, the results of this meta-analysis may be limited in their applicability to fathers.

### 6.2. Suggestions for future research

Meta-analyses often highlight areas in which more research is needed. As indicated earlier, meta-analysis can only compare the importance of factors that have been studied in the empirical research. If there are unstudied factors they cannot show up as important in the meta-analysis. We were unable to identify studies for 17 risk factors for child neglect. Some of the important risk factors for child physical abuse (unplanned pregnancy, parent use of corporal punishment, parent anxiety, past criminal behavior, family conflict, family cohesion, and spousal violence) were not found in the literature review for child neglect. A clear implication for future research involves the need for more research on child neglect.

In addition, future research needs to be conducted with subsets of these meta-analyses in order to conduct moderator analyses. To understand how moderator factors such as age of child, type of sample (community versus clinical), etc. influence the strength of the effect sizes future work is needed. Since D-Stat (Johnson, 1989), the software used in these analyses to calculate effect sizes, uses a fixed effects model it is especially important that future work results in well-fitting models. Models with random effects components reduce to fixed effect models when they are well fitting (Kinney & Dunson, 2006).

Our review also indicates the need for more research on abusive fathers and more research comparing mothers and fathers in abusive and neglectful families. We were able to calculate effect sizes for only two studies of parental gender for child physical abuse and no studies for child neglect. It is imaginable that a different pattern of predictive factors of abuse and neglect exists for fathers than for mothers. However, the present study was forced to combine mothers and fathers due to an insufficient number of studies on fathers to compute an effect size for most factors. Future research should also make the distinction between offending and non-offending parents in the methodology of studies and in the reporting of results.

This study identifies factors that are associated with child maltreatment. The nature of this association remains to be determined. For example, it is not yet known which factors are the best predictors of future maltreatment, only which factors are related to maltreatment. Further research into the use of the risk factors identified by the present study to predict recidivism in known cases of child maltreatment would be valuable in improving the accuracy of child maltreatment risk assessment procedures.

Furthermore, a number of studies were excluded from this meta-analysis because they did not include the basic statistics needed to calculate effect sizes. As meta-analysis is increasingly utilized in the social sciences, it becomes increasingly important for authors to include data necessary to calculate effect sizes in the published results. For example, means, standard deviations, zero-order correlation matrix, and sample sizes should be included for all groups.

### 6.3. Clinical implications

Knowledge of the risk factors associated with child maltreatment is important in assessing the level of risk for future child maltreatment, and for preventing and treating child maltreatment. The relative effect sizes presented in Tables 1 and 2 should be of considerable interest to clinicians responsible for assessing and intervening with abusive families. The risk factors with large effect sizes in either analysis i.e., parent perception of child as problem, parent–child relationships, parent anger/hyper-reactivity, parent stress, parent self-esteem, family conflict, family cohesion, and child social competence are clearly factors that should be addressed in child maltreatment assessment and treatment. The results of this meta-analysis also point to the importance of addressing the mental health needs of abusive and neglectful parents. Anxiety, depression and other forms of psychopathology appear to be important risk factors for child maltreatment. Finally, the importance of family conflict and family cohesion as risk factors for child physical abuse suggest that systemic interventions with the entire family may be necessary to reduce the likelihood that abuse may recur.

### 6.4. Summary

This meta-analytic literature review contributes to the understanding of the risk factors related to child physical abuse and neglect. It is the first meta-analysis examining a variety of risk factors. The results of this

study provide some indication of the strength of various risk factors in child maltreatment and the importance of a multi-factorial approach to assessment and intervention in child maltreatment. This study also highlights gaps in the literature on child neglect and on abusive and neglectful fathers. Future research is needed to correct these gaps.

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