

# The Relationship Between Parenting and Delinquency: A Meta-analysis

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**Abstract** This meta-analysis of 161 published and unpublished manuscripts was conducted to determine whether the association between parenting and delinquency exists and what the magnitude of this linkage is. The strongest links were found for parental monitoring, psychological control, and negative aspects of support such as rejection and hostility, accounting for up to 11% of the variance in delinquency. Several effect sizes were moderated by parent and child gender, child age, informant on parenting, and delinquency type, indicating that some parenting behaviors are more important for particular contexts or subsamples.

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Although both dimensions of warmth and support seem to be important, surprisingly very few studies focused on parenting styles. Furthermore, fewer than 20% of the studies focused on parenting behavior of fathers, despite the fact that the effect of poor support by fathers was larger than poor maternal support, particularly for sons. Implications for theory and parenting are discussed.

**Keywords** Child-rearing · Delinquency · Meta-analysis · Moderators · Development

Parents of young people are often blamed for the delinquent behavior of their children. In some courts parents are even penalized for the antisocial conduct of their children (e.g., Bessant and Hil 1998; Drakeford 1996; Dundes 1994). Although lay as well as scholarly theories assume that a link between parenting and delinquency exists, clear conclusions concerning the magnitude of this link are difficult to draw. An important reason for this difficulty is the heterogeneity of the studies and their findings in this field of research. Studies vary on the kinds of delinquency and parenting dimensions that are investigated, on how these constructs are measured, and on the populations from which the samples are drawn. In a series of meta-analyses we summarize and integrate previous findings on the link between parenting and delinquency. The first goal is to analyze which parenting dimensions are related to delinquency and the second is to identify moderators that affect the parenting–delinquency association.

Research on family antecedents and correlates of delinquency is of direct importance to both theory and practice. Interest in the family was apparent in early theories on social disorganization (Gove and Crutchfield 1982; Van Voorhis et al. 1988), and in the social bond model of Hirschi (1969). Other theories such as those of

Moffitt (1993, 2006) and Patterson (e.g., Patterson and Yoerger 2002) go beyond explaining only level differences in delinquency and examine how delinquency changes by age. The child's difficult behavior affects parents' disciplinary strategies, resulting in harsher and inconsistent punishments and less involvement by parents in the socialization process (Patterson 1982). These negative child-parent transactions increase the risk of setting a child off on a delinquent path that starts in the early teens, entails many delinquent acts and persists far into adulthood (Moffitt 1993; Patterson and Yoerger 2002).

Moreover, insight in these processes is essential for the development or improvement of prevention and intervention strategies. Interventions need to be "theory-driven" and based on sound research in order to be successful (Kazdin 2001). Therefore, knowledge on the link between parenting and delinquency has implications for prevention and intervention policies focusing on delinquency, in particular parent education and skills training.

### Conceptual Framework

Two perspectives have been adopted in the parenting literature: research that is focused on dimensions of parenting and research focusing on typologies (Darling and Steinberg 1993; O'Connor 2002; Ten Haaf 1993). Dimensions are concepts to categorize parenting behaviors such as affection, punishment, monitoring, whereas typologies are constellations of parenting dimensions such as an authoritative parenting style which is a combination of supportive parenting, attachment and guiding the child's behavior by explanation and appropriate expectations for conformity.

Although various *parenting dimensions* have been proposed (see for an overview Holden 1997), two key dimensions, support and control, have been used to assess the quality of parenting behavior (Maccoby and Martin 1983). The *support dimension* (also labeled warmth, responsiveness or acceptance–rejection by some scholars), refers to parental behaviors toward the child that makes the child feel comfortable, accepted and approved (Rollins and Thomas 1979). The support dimension can be represented as a range of positive and negative behavioral aspects such as acceptance, affection, love, support, warmth, responsiveness, sensitivity, communication and intimacy, but also hostility, neglect, and rejection (Rohner 2004; Rollins and Thomas 1979; Ten Haaf 1993). These various aspects of parental support, whether negative or positive can be placed along the continuum of low to high support and is generally considered to be unidimensional (Ten Haaf et al. 1994). For example, rejection is represented by low scores and acceptance by high scores. In general, supportive parenting

behaviors are negatively linked to delinquency, indicating that high levels of support and warmth are associated with low levels of delinquency and that low levels of support or even rejection are linked to high levels of delinquency (e.g., Barnes and Farrell 1992; Juang and Silbereisen 1999; Simons et al. 1989).

The *control dimension* (also labeled demandingness), has been defined as placing demands on and controlling the child. Some scholars have argued that control should not be viewed as unidimensional, since this dimension could be further divided into separate constructs with different meanings. A common approach is to distinguish between authoritative control and authoritarian control (Baumrind 1968, 1971). *Authoritative control* reflects child-oriented and inductive discipline techniques such as guiding the child's behavior cognitively, giving information, and stimulating responsible behavior of the child, while *authoritarian control* refers to adult-oriented, coercive, restrictive, and firm discipline techniques and emphasizes the negative aspects of control such as harsh punishment and love withdrawal (e.g., Baumrind 1968, 1971). In general, authoritative control has positive effects on child behavior, while authoritarian control has been found to have negative effects on the child (Baumrind 1966). Too strict authoritarian control (Farrington 1989) and harsh punishment (Farrington et al. 2003) appear to be linked to high levels of delinquent and antisocial behavior, although effect sizes vary substantially across studies (Loeber and Stouthamer-Loeber 1986).

More recently, Barber and colleagues have argued for a focus on behavioral and psychological control instead of authoritative and authoritarian control (e.g., Barber 1996; Barber et al. 2005). *Behavioral control* is defined as parents' attempts to control and regulate their children's behavior by rules setting and monitoring. Aspects of behavioral control such as monitoring (Fischer 1983) and consistency in discipline (Coughlin and Vuchinich 1996) have been associated with low levels of delinquency (see also Patterson 1982). *Psychological control* refers to intrusions into the psychological development of the child, such as love withdrawal, keeping the child dependent and the use of guilt to control the child. Behavioral control is more strongly linked to externalizing problems in adolescents, while psychological control is more strongly associated with internalizing problems (Barber et al. 1994). Thus, the parenting dimension control is often seen as a multidimensional concept. In the present analysis, this dimension is separated into either authoritative control and authoritarian control or behavioral control and psychological control.

Besides parenting dimensions, parenting *typologies or styles* are examined. Elaborating on the work of Baumrind (1966, 1971), Maccoby and Martin (1983) defined parenting

styles according to a two-dimensional framework of support and control. Accordingly, four parenting styles can be identified: authoritarian (low support, high control), authoritative (high support and control), permissive (high support and low control), and neglecting (low support and control). Parenting styles are configurations of attitudes and behaviors of parents towards their child and create a context or a climate for the parent's behavior and is displayed across many different situations (Darling and Steinberg 1993). From a typological viewpoint single parenting behaviors do not properly account for the interactional nature and dynamics of families and therefore parenting dimensions should not be examined in isolation (O'Connor 2002). Prior research revealed that an authoritative style had positive effects on child adaptation, whereas the remaining styles place the child at risk for negative child outcomes (Maccoby and Martin 1983). Neglectful parenting in particular has been linked to delinquent behavior (Maccoby and Martin 1983; Steinberg et al. 2006; Steinberg et al. 1994).

In the present study we examine various parenting dimensions, including parental support, and various types of control, and patterns of parenting behaviors (i.e., parenting styles) in relation to delinquency. We also examine discrete parenting behaviors (such as affection, hostility, monitoring, etc.) in order to identify which specific child-rearing characteristics are linked to child outcomes with the purpose of discovering effective ingredients for interventions.

### Prior Meta-analyses

There are several reasons that make it appropriate to conduct a meta-analysis. First, a considerable body of empirical research on the relationship between family factors and delinquency exists. Moreover, the inconsistencies in the literature make it difficult to summarize the results in a narrative review. For example, Wells and Rankin (1988) concluded that aspects of parental control such as normative regulation, monitoring and punishment have the same impact on delinquency as parental attachment, whereas Wright et al. (2000) concluded that results on parental control are mixed with inconsistent findings. A meta-analysis is useful for identifying whether effect sizes are homogeneous across studies and in the case where they are not, moderators can be investigated to identify the source of the mixed results.

A few meta-analyses have examined the association between parenting and delinquency. Several meta-analyses focused on risk factors for delinquency have included family factors (Cottle et al. 2001; Gendreau et al. 1996; Hubbard and Pratt 2002; Lipsey and Derzon 1998; Loeber and Dishion 1983). Next to offence history, family factors

were among the best predictors of recidivism compared to other domains, such as socio-economic status, intellectual functioning, and personal distress (Cottle et al. 2001; Gendreau et al. 1996). A disadvantage of meta-analyses on risk factors is that the units of focus are very broad and several family factors such as family size, attachment, and punishment have been combined into the same category. Furthermore, only a small number of parenting characteristics have been included in these reviews.

Only one previous meta-analysis considered the association between various aspects of parenting and delinquency (Loeber and Stouthamer-Loeber 1986) and included such factors as neglect (e.g., parent-child involvement), conflict (discipline and rejection), deviant behaviors and attitudes (e.g., parental criminality), and disruption (e.g., marital relations and parental absence). Among the over seventy studies reviewed, the best predictors of delinquency and problem behavior included lack of parental supervision, parental rejection, and parent-child involvement. Parental discipline appeared to be a weaker predictor than other family variables.

The present study extends the work of Loeber and Stouthamer-Loeber (1986) by using more advanced meta-analytic techniques including tests of homogeneity of effect sizes and moderator analyses. Moreover, the present meta-analysis includes many new investigations that have been completed since the Loeber and Stouthamer-Loeber review.

### Moderator Analysis

Studies differ considerably with regard to characteristics of the sample and measurement instruments, and these factors may influence the magnitude of the link between parenting and delinquency. Therefore, our second goal is to identify potential moderators. We consider four main moderators: gender of the child and the parent, delinquency source and type, informant on parenting (parent or child), and short- vs. long-term relationships and also analyze methodological moderators related to study quality.

### Sex-Differences

Males are more involved in delinquent behavior than females. One of the explanations of the higher level of delinquency in males than in females is that the etiology of delinquency may differ for males and females. Males may be more vulnerable to risk factors for delinquency such as inadequate parenting than females (Moffitt et al. 2001). Another hypothesis is that risk factors for delinquency are the same for males and females (Moffitt et al. 2001) but that males are exposed to risk factors more than females. Studies on sex-differences in the link between family

factors and delinquency are scarce and their findings are contradictory. Some studies report stronger effects of parenting variables in girls (e.g., Nye 1958), while others conclude that the family is more important to boys (Hay 2003; Rothbaum and Weisz 1994) and still others find very few sex-differences in family risk factors of delinquency (Hubbard and Pratt 2002; Loeber and Stouthamer-Loeber 1986). Therefore, studies on males and females are compared in the current meta-analysis in order to help clarify theoretical and empirical discrepancies.

In addition to child gender, the gender of the parent is also included. The link between fathers' parenting and mothers' parenting to adolescents' delinquency may differ for several reasons. First, apart from the fact that the *quantity* of the time fathers and mothers spend with their children is different, there are indications that parental involvement is also *qualitatively* different (Videon 2005). Compared to other relatives such as the mother, siblings, and grandparents, the father's arrest is the strongest predictor of the boy's offending behavior (Farrington et al. 2001). Moreover, the longer antisocial fathers live with their families the higher the risk for their children's antisocial behavior (Jaffee et al. 2003). A possible explanation for this finding is that children have the tendency to model the behavior of the parent with the same sex (Laible and Carlo 2004) and yet it is also likely that these fathers exhibit problematic parenting behaviors. Despite these results, relatively little research has examined the quality of fathers' parenting compared to mothers' parenting in relation to the child's well-being and behavior (Williams and Kelly 2005).

#### Short-Term vs. Long-Term Associations

Another important issue is whether or not parental behavior and parent-child relations have stronger or weaker relations to delinquency *over time*. The bidirectional-transactional feature of child-rearing (Colpin 1999) suggests that change is possible; nevertheless, parenting is found to be relatively stable across time (Holden and Miller 1999). Theories on the causes of crime have contradictory hypotheses on this issue. Static theories, such as Gottfredson and Hirschi's theory (1990) which focus on inter-individual differences suggest that the parenting-delinquency link is relatively the same over the life-course. This hypothesis has been challenged by dynamic developmental theories such as Sampson and Laub's (2005) age-graded theory predicting that the relationship between parenting and delinquency will change over time. As youngsters age, social ties to labor or marriage can modify trajectories of criminal offending and the influence of the family of origin should decrease over time. In light of the theories concerning whether the family

has enduring importance we address this issue empirically by testing whether study design (cross-sectional or longitudinal), time-interval between measurements, and age of the subjects moderate the parenting-delinquency link.

#### Delinquency Type and Source

Some scholars argue that self-report measures should be used for less serious crimes and for most serious crimes one should collect information from official records (Babinski et al. 2001). One of the reasons for this is that participants are less likely to report serious stigmatizing crimes, such as assault and hitting a spouse or partner than minor delinquency (Babinski et al. 2001). Some scholars maintain that results are generally similar for studies that used self-reported delinquency compared to those examining official measures (Gove and Crutchfield 1982), while others finding stronger results for official records compared to self reports (Loeber and Stouthamer-Loeber 1986).

Related to the seriousness is the type of delinquency. Delinquency type is typically classified in two categories: overt and covert delinquency (e.g., Loeber 1996). Overt delinquency refers to violent offences such as attacking someone with or without a weapon, threatening, murder, and rape. Covert delinquency refers to non-aggressive acts such as shoplifting, pick pocketing, arson, vandalism, and selling drugs. Overt aggressive and more serious offences are more common in early-onset delinquents. These delinquents are furthermore characterized by problems in their childhood such as poor family functioning (Moffitt and Caspi 2001). Covert non-aggressive delinquency, on the other hand, is relatively more often found in nonpersistent adolescent-onset delinquents, who have relatively normal backgrounds (Moffitt and Caspi 2001). On the basis of these findings one would expect to find stronger links between poor parenting and overt delinquency compared to covert delinquency. Loeber et al. (2008) studied antecedents of violence and theft and found many unique factors that differentially predicted violence and theft, in particular at older ages. For example, engaging in a family social welfare program was predictive of violence whereas child maltreatment was predictive of theft. These findings stress the importance of distinguishing between overt and covert delinquency. Given these issues, we included the source (self-reported or official delinquency) and type (overt or covert) of delinquency as a possible moderator on the parenting-delinquency link.

#### Parenting Informant

Some studies on parenting and delinquency used information about parenting reported by the child, whereas other studies used the parent as an informant. Results of

parenting–delinquency associations may be different for these informants, because family members experience their interactions differently and therefore have dissimilar views on parenting and parent–child relations (e.g., Lanz et al. 2001) with parents more likely to outline the positive characteristics of their family (Steinberg 2001) whereas adolescents tend to overestimate the negative aspects of parenting because they want to express their uniqueness and independence (Noller and Callan 1988). In the present meta-analysis, studies with the child as informants are therefore compared with studies on parenting reported by the parent.

### Methodological Moderators

Following Mullen's (1989) advice to include studies of varying quality, no studies were excluded on the basis of the quality of their design. The reason for this is that assessing the quality of a study appropriately is complicated and often problematic. However, as a check on quality control, we also examined whether several methodological characteristics (sample size, number of items in delinquency and parenting questionnaires, reliability of the parenting questionnaire, publication status, and journal impact factor), moderated the link between parenting and delinquency.

In summary, this study addresses the following research questions: Which parenting dimensions, styles, and behaviors are related with delinquency? How strong is the connection between parenting and delinquency? Do stronger associations emerge with samples of males or females and with fathers or mothers? Are long-term associations stronger than short-term associations? Which source (self-reported or official) and type (overt or covert) of delinquency yields the strongest effect sizes? Which informant of parenting (parent or child) yields the strongest parenting–delinquency association? Finally, as has been done in previous meta-analyses we also examine methodological characteristics which are indicators of the study quality.

## Method

### Selection of the Studies

Four selection criteria were used to select studies: operationalization of delinquency and parenting (described in more detail below), investigations on Western samples only (given cultural differences in parenting), and investigations where bivariate associations between parenting and delinquency were reported (as multivariate results cannot be compared across studies). Delinquency was defined as

behavior prohibited by the law were selected.<sup>1</sup> Parenting was defined as behavior of the parent that is directed toward the child and therefore included such practices as punishment, monitoring, affection, and communication. Factors that referred to behavior of the parent in which the child was not directly involved, such as criminality by parents, marital problems, and parental depression were excluded.

On the basis of the selection criteria, studies were collected according to the following procedure. First, electronic databases such as ERIC, PsycINFO, Sociological Abstracts and Criminal Justice Abstracts were searched for articles, books, chapters, paper presentations, dissertations and reviews. Search terms such as delinquency, crime, criminals, offenders, anti-social were cross-referenced with parenting, child-rearing, and parent-influence. Next, manual searches were applied in which reference lists of reviews and other articles were checked in order to find relevant studies not found in the electronic databases. Finally, experts in the field were asked whether they knew of any other relevant published or unpublished studies.<sup>2</sup> We found a total of 161 published and unpublished papers that met the selection criteria.

### File Drawer Problem

Publication bias is the tendency of journals to accept papers that report strong significant associations over publications with nonsignificant or small effects (e.g., Mullen 1989; Rosenthal 1991). Rosenthal (1979) identified this problem as the file drawer problem. The best solution to this difficulty is to try to obtain all published and unpublished material as best as possible. Additionally, a method to test whether the results of the analysis of the combined effect sizes are reliable is to calculate a fail-safe number (Rosenthal 1991), the number of unpublished studies that have not been found with a non-significant result that will decrease the combined effect size to non-significant. The present meta-analysis includes unpublished studies and also provides fail-safe numbers. However, because the quality of unpublished studies is questioned because they have not gone through peer review, we noted and analyzed the effects of publication status (i.e., published or not) and four other quality indicators: reliability of questionnaires (0.39–0.96), sample size (35–6,751),

<sup>1</sup> Studies on problem behavior, which we consider as behavior that is not prohibited by the law, were not included. Nevertheless, we found many studies that used self-reported questionnaires for measuring delinquency. Often, these questionnaires had both items on problem behavior or status offences and delinquency. These studies were included in our meta-analysis.

<sup>2</sup> We contacted Rolf Loeber, Magda Stouthamer-Loeber, and Maja Dekovic, who drew our attention to four other empirical studies that we did not detect through the other methods.

number of informants (1–5), and impact factor of the publication (0.157–10.519). Impact factor refers to the average number of citations to the articles in a journal. We assigned an impact factor of zero if studies were presented in paper presentations, dissertations, books, and book chapters.

#### Classification of Parenting Variables

In total 432 different parenting variables were identified across the 161 studies. The parenting variables were classified into nine constructs or categories which were made on the basis of the literature on parenting. Parenting behaviors (behaviors of parents directed to the child) were assigned to the parenting dimensions: (1) *support*, (2) *authoritative control*, (3) *authoritarian control*, (4) *behavioral control*—including active monitoring<sup>3</sup>, (5) *psychological control*, (6) *general control*—concepts that are too broad for classification in a specific kind of control, (7) *general parenting*—aspects that covered both support and control, (8) *indirect parenting behavior*—parental knowledge and child disclosure (see footnote 3), and (9) *other parenting*—all remaining parenting that did not fit the other categories (e.g., fairness of discipline, co-parenting). Given that the variables in the last category do not conceptually form a unity, we only described the results of these studies and computed mean effect sizes for each parenting behavior in this category if there are at least three studies. We did not subject this category to moderator analyses. The classification system including a list of the parenting categories and variables is presented in the [Appendix](#). The first author coded the parenting variables on the basis of their names and descriptions. Reliability of the coding scheme was checked by having 100 randomly selected parenting variables coded by two educational sciences students. After training, the students independently classified the parenting variables into the categories. Interrater agreement was quite high with the percentage of agreement between the first author and the students being 87.0% and 87.1% ( $\kappa=0.85$  vs.  $\kappa=0.85$ ) and 88.6% ( $\kappa=0.87$ ) between the two students.

#### Coding of Moderator Variables

Study characteristics were extracted from the articles and reports (see [Table 1](#) for an overview). The following study

<sup>3</sup> Parental monitoring is often operationalized as parental knowledge of the child's whereabouts, while this is not parental behavior (e.g., Kerr et al. 1999). Therefore we distinguished between active monitoring behavior by the parent, parental knowledge, and information on whereabouts given by the child. Parental monitoring was classified into the category *behavioral control* and parental knowledge and child disclosure were classified into the category *indirect parenting behavior*.

**Table 1** Description of Some Major Characteristics of Article and Study Used in the Present Meta-Analysis

Study characteristics	Frequency	Percentage
General study characteristics		
Year of publication ( $k=161$ )		
1950–1970	9	5.6
1970–1979	6	3.7
1980–1989	20	12.4
1990–1999	57	35.4
2000–2007	69	42.9
Publication status ( $k=161$ )		
Published	143	88.8
Unpublished	18	11.2
Impact factor <sup>a</sup> ( $k=161$ )		
0	42	26.1
0.163 to 0.999	40	24.8
1 to 1.999	23	14.3
2 to 2.999	1	0.6
3 to 3.999	23	14.3
4 to 4.999	12	7.5
10 to 13.936	1	0.6
Not specified	19	11.8
Sample characteristics		
Continent ( $k=119$ )		
North America	83	69.7
Europe	32	26.9
Australia	4	3.4
Degree of urbanization ( $k=119$ )		
Urban area	69	58.0
Rural area	8	6.7
Mixed	32	26.9
Not specified	10	8.4
Sample type ( $k=126$ )		
Delinquents overrepresented	42	33.3
Representative	70	55.6
Other	14	11.1
Sex of the target child ( $k=149$ )		
Males	43	29.5
Females	24	16.4
Mixed	79	54.1
Percentage of ethnic minorities ( $k=130$ )		
0–10	32	24.6
10–19	13	10.0
20–29	4	3.1
30–39	8	6.2
40–49	9	6.9
50–59	4	3.1
60–69	0	0.0
70–79	2	1.5
80–89	5	3.8
90–100	19	14.6

**Table 1** (continued)

Study characteristics	Frequency	Percentage
Not specified	34	26.2
Delinquency characteristics		
Delinquency type ( <i>k</i> =133)		
General delinquency	106	79.7
Overt delinquency	17	12.8
Covert delinquency	10	7.5
Source of delinquency ( <i>k</i> =132)		
Self-report	100	75.8
Official record	20	15.2
Combination	9	6.8
Parent report	3	2.3
Number of informants ( <i>k</i> =127)		
1	116	91.3
2	7	5.5
3	3	2.4
4	1	0.8
Age ( <i>k</i> =160)		
6.0–8.9	2	1.3
9.0–11.9	9	5.6
12.0–14.9	47	29.4
15.0–17.9	72	45.0
18.0–20.9	12	7.5
21.0–29.9	8	5.0
30.0–59.9	8	5.0
Not specified	2	1.3
Age range ( <i>k</i> =129)		
1 year	21	16.3
2–5	58	45.0
6–10	42	32.6
11–18	4	3.1
Not specified	4	3.1
Period <sup>b</sup> ( <i>k</i> =147)		
0 to -1	70	47.6
-1 to -3	5	3.4
-3 to -10	10	6.8
< -10	1	0.7
Ever	43	29.3
Incarcerated	6	4.1
Not specified	12	8.2
Percentage of problem behavior ( <i>k</i> =136)		
0%	49	36.0
1–19.99%	13	9.6
20–39.99%	20	14.7
40–59.99%	13	9.6
60–79.99%	16	11.8
Not specified	25	18.4
Parenting characteristics		
Actor ( <i>k</i> =293)		
Father	58	19.8

**Table 1** (continued)

Study characteristics	Frequency	Percentage
Mother	65	22.2
Both parents or parent not specified	170	58.0
Informant ( <i>k</i> =293)		
Parent	47	16.0
Subject	202	68.9
Observer	9	3.1
Official record	1	0.3
Combination	34	11.6
Number of informants ( <i>k</i> =293)		
1	259	88.4
2	16	5.5
3	12	4.1
4	1	0.3
5	5	1.7
Age <sup>c</sup> ( <i>k</i> =293)		
5–7.9	3	1.0
8–10.9	27	9.2
11–13.9	73	24.9
14–16.9	153	52.2
17–19.9	23	7.8
20–39.9	7	2.4
Not specified	7	2.4
Age range ( <i>k</i> =293)		
1 year	45	15.4
2–5	144	49.1
6–10	88	30.0
11–18	7	2.4
Not specified	9	3.1
Methodological characteristics		
Sample size ( <i>k</i> =293)		
34–50	8	2.7
50–99	31	10.6
100–199	42	14.3
200–499	102	34.8
500–999	60	20.5
1,000–9,999	50	17.1
Time interval ( <i>k</i> =293)		
0 years	208	71.0
0.1–4.9	47	16.0
5–9.9	16	5.5
10–35	22	7.5
Test statistic ( <i>k</i> =293)		
Continuous	233	79.5
Dichotomous	42	14.3
Mixed	13	4.4
Other	5	1.7
Design ( <i>k</i> =127)		
Cross-sectional	88	69.3

**Table 1** (continued)

Study characteristics	Frequency	Percentage
Longitudinal	35	27.6
Retrospectief	4	3.1
Number of items (delinquency; $k=149$ )		
1	3	2.0
2 to 5	10	6.7
6 to 10	31	20.8
11 to 20	41	27.5
21 to 50	31	20.8
51 to 100	4	2.7
101 to 130	1	0.7
Not specified	28	18.8
Number of items (parenting variables; $k=293$ )		
1	31	10.6
2 to 5	76	25.9
6 to 10	81	27.6
11 to 20	28	9.6
21 to 30	8	2.7
31 to 40	10	3.4
41 to 50	2	0.7
51 to 60	2	0.7
Not specified	55	18.8
Reliability (parenting variables; $k=293$ )		
0.39 to 0.50	4	1.4
0.51 to 0.60	10	3.4
0.61 to 0.70	32	10.9
0.71 to 0.80	63	21.5
0.81 to 0.90	71	24.2
0.91 to 0.96	8	2.7
Not specified	105	35.8

For the General study characteristics  $k$  equals the number of articles. For the sample characteristics,  $k$  equals the number of samples; for the parenting characteristics,  $k$  equals the number of analyses

<sup>a</sup> Impact factors were retrieved from ISI Web of Knowledge. Journals not found in this database fall under 'Not specified'

<sup>b</sup> The period in which delinquent behavior took place, for example  $-1$  means that crimes were committed in the last year, and  $-3$  means that crimes were committed in the last 3 years

<sup>c</sup> Age at the time of the parenting measurement goes past 18 years, because several studies had a retrospective design

characteristics were analyzed as moderators. In order to analyze *sex-differences* we coded sex of the target child (males, females, or both) and the active agent or actor (e.g., father, mother, both parents or parents not specified). With regard to *short-term versus long-term associations* we coded: design (cross-sectional, longitudinal, or retrospective), time interval in months between the two measurements (if the study design was cross-sectional this variable was set at zero), age of the subjects at the time of the delinquency measurement, and age of the subjects at the time of

measurement of the parenting characteristic. With regard to *delinquency type and source* we coded: delinquency type (general delinquency, overt delinquency, or covert delinquency), percentage of problem behavior within the delinquency construct (i.e., the proportion of items on non-illegal problem behavior within questionnaires on delinquency), and source of delinquency information (self-report, official record, or both). Furthermore, we coded the *informant* of the parenting characteristic (e.g., father, mother, subject, observer). Finally, the following *methodological characteristics* were coded: publication status (published, unpublished), impact factor of the journal (zero for unpublished studies and book chapters), sample size, number of items in delinquency self-report questionnaire, number of items in parenting questionnaire, reliability of parenting questionnaire (Cronbach's alpha).

### Analyses

For each study an effect size was calculated. We used Pearson's  $r$  to express the relationship between a parenting characteristic and delinquency. We used the formulas of Mullen (1989) to transform the test statistics  $\chi^2$ ,  $F$ ,  $t$  or  $p$  values into correlation  $r$ . The test statistic  $\phi$  (phi) was transformed to a  $\chi^2$  via the formula  $\chi^2 = \phi^2 \times N$ , with  $N$  as the sample size which in turn was transformed to  $r$ . When studies reported odds ratio's and  $\gamma$ 's, we constructed a  $2 \times 2$  cross-table in order to calculate a  $\chi^2$ , using information about percentages of delinquent behavior and parenting variables. If these proportions were not presented, we applied the approximation of a tetrachoric correlation of Digby to transform the odds ratio's into correlations (Bonett 2007). If studies only reported that a relationship was significant or not, we applied conservative estimation procedures, meaning that we assigned a  $p$  value of 0.50 if a non-significant effect was reported and a  $p$  value of 0.05 for significant associations (Mullen 1989).

Each correlation  $r$  was transformed to a Fisher's  $Z$  before combined effect sizes were calculated and moderator-analyses were conducted (Mullen 1989). For each parenting category we conducted a meta-analysis. We examined the extent of the variation in effect sizes (Hedges and Olkin 1985). For the calculation of combined effect sizes and the moderator-analyses, we used the SPSS macros of Lipsey and Wilson (2001) and random effects models given that most effect sizes were heterogeneous (Lipsey and Wilson 2001; Rosenthal 1995). This method is rather conservative and has the advantage of allowing the results to generalize to studies that are not in the meta-analysis. Furthermore, we calculated fail-safe numbers and analyzed whether outlying effect sizes were in our data base of studies on the basis of standardized  $z$ -values larger than 3.29 or smaller than  $-3.29$  (Tabachnick and Fidell 1989). No outliers were identified.



## Independence of Study Results

Independence of study results is desirable when conducting a meta-analysis in order to preclude that a particular study is weighted more strongly than the others (Lipsey and Wilson 2001). In the current meta-analysis, dependence of study results was prevented by combining the results of dependent studies or by using only one study result. We used three different methods for eliminating dependence. First, in some manuscripts results regarding the same sample were reported and therefore the results across studies were combined into one effect size and used that in all sub-analyses. For example, results on the relationship between monitoring and delinquency in the Cambridge–Somerville Youth Study were published in three journal articles (McCord 1991a, b, 1996).

Second, if a study characteristic of a dependent study was less common, we used only this study result. For example, both self-reported delinquency and official delinquency were analyzed regarding the same sample (Farrington 1989, 1990, 2002; Farrington and Hawkins 1991; Farrington and Loeber 1999; West and Farrington 1973, 1977). We chose the analyses on official delinquency, because studies on official delinquency are less commonly available. If a study reported results for both males and females, we used the results on females (e.g., Riley and Shaw 1985). In some other studies both the mother and father were informants on their parenting behavior. Given that studies on fathers' parenting behavior were relatively scarce, we selected studies on fathers (e.g., Stattin and Kerr 2000).

Third, some manuscripts reported on more than one sample (e.g., Heaven and Virgen 2001). In most cases we averaged the results following the procedure of Mullen (1989). To retain the distinctions between the discrete parenting behaviors in the analyses, rather than averaging the results or selecting one of them, we used Cooper's (1989) shifting unit of analysis. For the analysis on the level of the discrete parenting behaviors we used all analyses within one study. However, in analyses at the level of parenting dimensions we selected one analysis per study.

## Results

### Description of Studies

Table 1 presents a description of the 161 manuscripts, containing 119 independent studies. As shown in the table, the majority of the data came from studies conducted in the United States. All studies that we included in the meta-analysis were published between 1950 and 2007. The

majority of studies (87%) was conducted after 1986, the year in which the meta-analysis of Loeber and Stouthamer-Loeber (1986) was published. The sample sizes were quite varied, ranging from 34 to 18,260, with most between 200 and 500. The designs were most frequently cross-sectional (88 studies). Only four studies used a retrospective design, and 35 studies were longitudinal. The data included samples of only females, only males or both. Samples with only females were relatively limited (16%). Furthermore, the vast majority of samples consisted of a certain proportion of ethnic minorities (85%).

### Central Tendency

*Parenting Dimensions* Mean effect sizes for associations between parenting dimensions (support and various forms of control) and delinquency were all significant and ranged in strength from .12 for authoritative and authoritarian control to 0.23 for psychological control (Table 2). Differences in mean effect sizes between parenting dimensions were significant ( $Q(5)=13.7, p<0.05$ ). Among the parenting dimensions the highest mean effect sizes were found for psychological control, referring to parents who keep their child dependent, try to change the feelings of their child, use guilt to control the child or ignore the child as a form of punishment. Furthermore, general control, referring to variables that combine various aspects of discipline into one construct, was significantly related to delinquency and had a relatively high effect size ( $ESr=-0.21$ ). According to the criteria of Cohen (1988) for small, moderate and large effect sizes ( $r=0.10, r=0.24, \text{ and } r=0.37$  respectively), the correlation between psychological control and general control, and delinquency are moderate in size. The remaining parenting dimensions, support, and authoritative, authoritarian and behavioral control, have small to moderate significant associations with delinquency. Post-hoc comparisons revealed that differences between the four types of control were significant ( $Q(3)=8.8, p<0.05$ ) and that differences in effect sizes between support and control dimensions and between behavioral and psychological control were nonsignificant ( $Q(1)=0.03, p>0.10$  for support versus control;  $Q(1)=1.0, p>0.10$  for behavioral vs. psychological control).

Given that scholars consider the support dimension as unidimensional (e.g., Ten Haaf et al. 1994), we initially did not further divide the support dimension into separate constructs with different meanings. However, we hypothesized that low levels of positive aspects of support might result in different mean effect sizes than high levels of negative aspects of support. For example, high levels of hostility and neglect may be more harmful for youngsters than low levels of understanding and support. In order to test

**Table 2** Meta-analytic Results For Each Parenting Category

Category	Studies ( <i>k</i> )	Subjects ( <i>N</i> )	Effect size ( <i>ESr</i> )	<i>Q</i>
Support	72	46,960	-0.19**	877.02****
Affection	12	3,901	-0.21****	46.8****
Involvement	3	861	-0.16*	16.9****
Supportive parenting	5	3,983	-0.23****	8.9*
Open communication	11	7,959	-0.07*	76.1****
Support positive (class)	29	24,268	-0.19****	538.0****
Neglectful	3	540	0.29***	1.8
Rejection	6	1,589	0.26****	16.1***
Hostility	5	1,252	0.28****	7.3
Support negative (class)	3	1,323	0.33****	29.7****
Authoritative control	15	9,162	-0.12**	45.71****
Rewarding	7	3,976	-0.11***	30.6****
Inductive parenting	5	1,071	-0.13***	6.9
Authoritative control (class)	4	3,944	-0.11**	8.0**
Authoritarian control	38	21,365	0.12**	250.22****
Physical punishment	12	8,089	0.10***	125.2****
Verbal aggression as punishment	3	1,400	0.14**	1.5
Punishment	10	2,704	0.13***	46.7****
Authoritarian control (class)	24	15,422	0.16**	123.9****
Behavioral control	55	40,378	-0.19**	1055.85****
Consistent discipline	5	2,255	-0.12	14.4**
Inconsistent discipline	4	3,139	0.20***	19.0****
Discipline	6	1,691	-0.20***	33.4****
Rules setting	8	9,887	-0.13***	7.2
Decision making	3	3,245	-0.18**	2.1
Permissiveness	10	10,391	0.09**	95.5****
Monitoring	28	19,289	-0.23****	541.5****
Behavioral control (class)	22	16,126	-0.16****	195.4****
Psychological control	23	10,344	0.23**	189.37***
Psychological control	13	5,190	0.21****	52.4****
Overprotection	3	3,426	0.21****	61.2****
Psychological control (class)	10	3,165	0.23****	10.6
General control	11	4,187	-0.21**	57.64****
General parenting	17	21,405	-0.17**	105.85****
Parenting	16	18,937	-0.18****	103.0****
Authoritative parenting style	8	9,089	-0.19****	26.9****
Indirect parenting behavior	51	36,121	-0.26**	762.16****
Knowledge	47	32,847	-0.26****	742.1****
Child disclosure	11	6,965	-0.31****	114.8****
Other parenting				
Co-parenting	4	1,200	-0.13****	2.5

*ESr* refers to the mean effect size and can be interpreted as a correlation *r*. Class between parentheses refers to a set of more than one aspect of this category (see Appendix). *Q*=within-class homogeneity statistic

\**p*<0.10, \*\**p*<0.05, \*\*\**p*<0.01, \*\*\*\**p*<0.001

this hypothesis we compared the effect sizes of negative versus positive aspects of support. Parenting behaviors such as trust, acceptance, supportive parenting, open communication, love, caring and warmth were considered as positive aspects of support (47 studies) and indifference, avoidance, neglect, hostility and rejection were regarded as negative aspects of support (seven studies). Several parenting variables

included both positive and negative aspects of support, such as 'parental acceptance' (low scores reflect rejection and high scores reflect acceptance) and 'parental care' (low scores reflect parental neglect and rejection and high scores reflect warmth and understanding). These parenting variables were considered as a separate category (18 studies). Studies on negative aspects of support resulted in significantly higher

effect sizes ( $ESr=0.30$ ,  $p<0.001$ ,  $k=7$ ) than studies on positive aspects of support ( $ESr=-0.17$ ,  $p<0.001$ ,  $k=47$ ). The mean effect size of these sets of results appeared to be significantly different ( $Q_b(1)=4.30$ ,  $p<0.05$ ).

Fail-safe numbers were calculated for each parenting category in order to estimate the number of unpublished non-significant studies that would have to have been found in order to decrease the combined effect size to non-significant. If the critical value suggested by Rosenthal (1991) is  $5k+10$  is not exceeded, a file drawer problem is indicated. Fail safe numbers ( $p=0.05$ ) ranged from 534 to 34,771 and exceeded the critical value. Possible file drawer problems were therefore not indicated and the significance levels of the effect sizes can be considered robust.

**Parenting Styles** Studies on parenting styles were classified into the category general parenting (Table 2;  $ESr=-0.17$ ). Very few studies analyzed specific parenting styles (Avenevoli et al. 1999; Hoeve et al. 2007; Simons et al. 2005; Steinberg et al. 1991) and surprisingly only one study included neglectful parenting (Avenevoli et al. 1999); therefore, we were only able to compute a mean effect size for authoritative parenting style ( $ESr=-0.19$ ,  $p<0.001$ ,  $k=4$ ). Only the study by Avenevoli and colleagues (1999) analyzed all four parenting styles in relation to delinquency, including neglectful parenting ( $r=-0.20$  for intact families and  $r=-0.17$  for single-parent families). Thus, given the small number of previous studies on parenting styles and delinquency, definite conclusions on whether parenting styles have stronger links to delinquency than parenting dimensions or which parenting style has the strongest link to delinquency cannot be drawn.

**Discrete Parenting Behaviors** Because the parenting dimensions categories are rather broad and knowledge on potential links between discrete parenting behaviors may be useful for investigating which specific child-rearing characteristics could be effective ingredients of interventions, we further analyzed smaller sets of analyses (see the Appendix, second column). If at least three analyses were available we calculated mean effect sizes on discrete parenting behaviors (Table 2). Furthermore, we tested whether mean effect sizes concerning discrete parenting behaviors were significantly different within a parenting dimension. These analyses revealed that the results of various aspects of support differed significantly ( $Q_b(4)=15.3$ ,  $p<0.01$ ). For example, we found a trend for a weak link between open communication and delinquency ( $ESr=-0.07$ ,  $p<0.10$ ,  $k=11$ ), while supportive parenting was moderately linked to delinquency ( $ESr=-0.23$ ,  $p<0.001$ ,  $k=5$ ) and negative aspects of support, such as combinations of neglect, hostility and rejection were strongly linked to delinquency ( $ESr=0.33$ ,  $p<0.001$ ,  $k=3$ ).

The magnitude of mean effect sizes varied considerably within the parenting dimension behavioral control (Table 2). For example, a significant but small link between permissiveness and delinquency was found ( $ESr=0.09$ ,  $p<0.05$ ,  $k=10$ ), whereas monitoring was found to have a significant moderate association to delinquency ( $ESr=-0.23$ ,  $p<0.001$ ,  $k=28$ ). Differences in these effect sizes, however, were not significant ( $Q_b(4)=7.2$ ,  $p>0.05$ ).

Within the remaining parenting dimensions (i.e., authoritative, authoritarian and psychological control), mean effect sizes of discrete parenting behaviors were relatively similar (Table 2). With respect to authoritarian control, mean effect sizes were relatively small, such as the link between physical punishment and delinquency ( $ESr=0.10$ ,  $p<0.01$ ,  $k=12$ ). The link between a combination of aspects of authoritarian control and delinquency was slightly stronger ( $ESr=0.16$ ,  $p<0.001$ ,  $k=24$ ). However, these mean effect sizes did not differ significantly ( $Q_b(2)=3.5$ ,  $p>0.05$ ). Mean effect sizes within authoritative control such as of rewarding and inductive parenting were relatively similar in strength and ranged from  $-0.11$  to  $-0.13$  (Table 2). Moderate effect sizes were found for psychological control ( $ESr=0.21$ ,  $p<0.001$ ,  $k=13$ ) and overprotection ( $ESr=0.21$ ,  $p<0.001$ ,  $k=7$ ). Again, these mean effect sizes did not differ significantly ( $Q_b(2)=3.5$ ,  $p>0.05$ ).

Indirect parenting behavior, which refers to parental knowledge and child disclosure, had a significant negative relationship with delinquent behavior ( $ESr=-0.26$ ,  $p<0.001$ ,  $k=47$ , for knowledge and  $ESr=-0.31$ ,  $p<0.001$ ,  $k=11$  for child disclosure). The link between these variables and delinquency was relatively the same as the link between parental monitoring and delinquency ( $ESr=-0.23$ ,  $p<0.001$ ,  $k=28$  for monitoring;  $Q(2)=0.7$ ,  $p>0.10$ ).

The remaining parenting behaviors (category: other parenting) ranged from  $r=-0.04$ ,  $p>0.10$ , for parental expectations (i.e., expecting the child to clean his or her bedroom, do the dishes, etc.) to  $r=-0.35$ ,  $p<0.05$ , for maternal problem solving statements during an interactive task with the child. A mean effect size was only computed for co-parenting as at least three studies focused on the link between this aspect of parenting and delinquency. A lack of parental agreement in upbringing was significantly related to delinquency ( $ESr=-0.13$ ,  $p<0.001$ ,  $k=4$ ).

In sum, the strongest mean effect sizes were found for negative aspects of support such as neglect, hostility and rejection or combinations of these parenting behaviors ( $ESr$  ranges from 0.26 to 0.33). In addition, parental monitoring, either active monitoring by parents, parental knowledge or child disclosure, was relatively strongly linked to delinquency ( $ESr$  ranges from  $-0.23$  to  $-0.31$ ). Furthermore, moderate effect sizes were found for psychological control and overprotection ( $ESr$  ranges from 0.21 to 0.23). The smallest effect sizes were found for

communication ( $ESr=-0.07$ ), permissiveness ( $ESr=0.09$ ), and physical punishment ( $ESr=0.10$ ).

### Moderator Analyses

Because the effect sizes in each of the parenting dimensions, general parenting and indirect parenting categories all had significant within-group variability (Table 2), moderator analyses were conducted for all broader parenting categories. We analyzed both *categorical moderators* such as gender of the subjects and design of the study and *continuous moderators* such as year of publication and number of measurements. Moderator analyses using categorical moderators were only conducted if both groups of the moderator included at least three studies. The significant results of the moderator analyses on discrete variables are presented in Table 3 and those on continuous variables in Table 4. Trends are only presented in the text. Results are reported separately for each moderator or group of moderators.

*Sex-Differences* We did not find any differences between males and females with respect to the link between parenting and delinquency. However, we found some differences between the link between delinquency and paternal and maternal parenting (Table 3—actor). Fathers' supportive behavior was more strongly related to delinquency ( $ESr=-0.22$ ,  $p<0.001$ ,  $k=20$ ) than mothers' support ( $ESr=-0.14$ ,  $p<0.001$ ,  $k=20$ ). In order to analyze whether parents had

more influence on a child with the same sex, we created a new moderator with the following categories: (1) fathers–sons and mothers–daughters, (2) fathers–daughters and mothers–sons. Because some groups did not meet our criterion of three studies, this moderator analysis could only be conducted with regard to three parenting dimensions. Within the category support this moderator was significant. The link between support and delinquency was stronger for fathers and sons and mothers and daughters ( $ESr=-0.27$ ,  $p<0.001$ ,  $k=13$  for same sex versus  $ESr=-0.08$ ,  $p>0.10$ ,  $k=4$  for different sex).

*Short-Term vs. Long-Term Associations* The moderators *time interval* between the measurements and *design* were nonsignificant, indicating that the parenting–delinquency link was relatively similar in longitudinal and cross-sectional studies. Because the participant's *age* does not remain constant in longitudinal studies and is not representative in retrospective studies, we removed the longitudinal and retrospective studies and conducted the moderator analyses on the cross-sectional studies only (Table 4). Significant effects of age were found on general parenting ( $z=-2.05$ ,  $p<0.05$ ,  $k=9$ ). The relationship between general parenting and delinquency was found to be stronger in younger adolescents and school age children than for older adolescents.

*Delinquency Type and Source* The moderator *delinquency type* was analyzed comparing studies on overt delinquency,

**Table 3** Results of ANOVA for Discrete Moderators

Group	Moderator			$Q_b$
	Subjects (N)	Studies (k)	ESr	
Delinquency type (3) <sup>a</sup>				
Indirect parenting behavior				4.58*
Overt	4,256	5	-0.23***	
Covert	4,155	3	-0.07	
Actor (7)				
Support				4.06*
Mother	6,711	20	-0.14***	
Father	11,778	20	-0.22***	
Parent and child same sex (3)				
Support				4.05*
Different sex	1,170	4	-0.08	
Same sex	4,881	13	-0.27***	
Informant (5)				
Authoritarian control				12.16**
Parent	5,681	10	0.05	
Child	11,749	23	0.17***	
More than one informant	3,935	5	0.05	

Note. ESr refers to the mean effect size and can be interpreted as a correlation  $r$ .  $Q_b$ =between-class homogeneity statistic

<sup>a</sup>The number between parentheses indicates the total number of analyses conducted for the moderator

\* $p<0.05$ , \*\* $p<0.01$ ,

\*\*\* $p<0.001$

**Table 4** Results of Regression Analyses for Continuous Moderators

Category	Moderator			
	Subjects ( <i>N</i> )	Studies ( <i>k</i> )	<i>Z</i>	Beta
Delinquency seriousness (8) <sup>a</sup>				
Percentage of problem behavior				
Indirect parenting behavior	32,336	41	2.36*	0.39
Age (8)				
Age (cross-sectional studies)				
General parenting	12,448	9	-2.05*	-0.55
Methodological characteristics (8)				
Impact factor				
Authoritative control	7,893	12	-1.90*	-0.48
General control	3,791	10	-2.28*	-0.65
Reliability (parenting measure)				
Indirect parenting behavior	21,834	30	2.76**	0.47

<sup>a</sup> The number between parenthesis indicates the total number of analyses conducted for the moderator  
\* $p < 0.05$ , \*\* $p < 0.01$

such as violent offences, and covert delinquency, such as car theft or vandalism (Table 3). Because most studies focused on general delinquency and to a much lesser extent on overt or covert delinquency we were able to conduct moderator analyses for only two parenting dimensions (support and indirect parenting). A significant difference was found between studies that measured overt delinquency and studies that analyzed covert delinquency in relation to indirect parenting behavior (knowledge and child disclosure). Studies on overt delinquency resulted in stronger links between parental knowledge and child disclosure and delinquency ( $ESr = -0.23$ ,  $p < 0.001$ ,  $k = 5$  vs.  $ESr = -0.07$ ,  $p > 0.10$ ,  $k = 3$ ). We expected studies that used questionnaires with items on non-illegal *problem behavior* to result in weaker effect sizes than measures reporting illegal offences only. Instead, effect sizes in the studies with measures including a higher proportion of non-illegal problem behaviors were stronger in the category indirect parenting behavior ( $z = 2.36$ ,  $p < 0.05$ ,  $k = 41$ ). Thus, studies on parental knowledge and child disclosure resulted in stronger effect sizes if delinquency questionnaires included relatively more items on non-illegal problem behavior (Table 4). The *source of delinquency* was not associated with effect size, indicating that no significant differences were found between studies using self-reported delinquency and studies relying on official delinquency.

*Informant of Parenting Behavior* Moderator analyses were performed in five categories of parenting dimensions with regard to the informant of parenting (Table 3). This moderator was significant with respect to authoritarian control. The studies on authoritarian control in which the child reported on the level of authoritarian discipline techniques, yielded significantly stronger associations than studies with a parent as informant ( $ESr = 0.05$ ,  $p > 0.10$ ,  $k = 10$ , parent informants vs.

$ESr = .17$ ,  $p < 0.001$ ,  $k = 23$ , child informants,  $ESr = 0.05$ ,  $p > 0.10$ ,  $k = 5$ , more than one informant respectively).

*Study Quality and Methodological Characteristics* Following Mullen’s (Mullen, 1989) advice to include studies of varying quality, no studies were excluded on the basis of the quality of their design. The reason for this is that assessing the quality of a study appropriately is complicated and often problematic. Instead, we examined study characteristics that address the issue of study quality as moderators such as sample size and reliability of parenting questionnaires. The following moderators that might refer to the study quality were analyzed: publication status, impact factor, sample size, number of items in the delinquency measure, number of items in the parenting measure, and reliability of the parenting measure. Because information about the reliability of the delinquency measure was unavailable most of the time, this study characteristic was not examined. *Impact factor* was significant in two parenting dimensions: authoritative control ( $z = -1.90$ ,  $p < 0.06$ ,  $k = 12$ ) and general control ( $z = -2.28$ ,  $p < 0.05$ ,  $k = 10$ ). Studies published in journals with a high impact factor reported smaller effect sizes than studies in low impact journals (Table 4). We found a trend for the moderator *sample size* in the parenting category indirect parenting behavior ( $z = -1.72$ ,  $p < 0.10$ ,  $k = 51$ ). Studies with smaller sample sizes showed a larger effect size than studies with larger numbers of subjects. For the *number of delinquency items* in a questionnaire we found a trend in the category psychological control ( $z = 1.68$ ,  $p < 0.10$ ,  $k = 19$ ), indicating that stronger links between psychological control and delinquency were found in studies that used measures with a larger number of items on delinquent acts. *Reliability of the parenting measure* was a significant moderator in one category: indirect parenting behavior ( $z = 2.76$ ,  $p < 0.01$ ,

$k=30$ ). We found a trend in the category authoritative parenting ( $z=1.92$ ,  $p<0.10$ ,  $k=12$ ), indicating a trend for the link between higher reliabilities and larger effect sizes. *Publication status* and *number of parenting items* did not moderate the effect size. Given that the study quality of retrospective studies is often questioned we conducted several analyses in order to investigate the potential influence of these studies. As mentioned above, study design was not associated with effect size. In addition, the recalculation of the mean effect sizes of studies excluding those with a retrospective design, did not lead to different conclusions, probably because there were so few retrospective studies.

## Discussion

In the present meta-analysis we tested the connection between parenting and delinquency. We focused on parenting from different perspectives, analyzing parenting dimensions, styles and behaviors in relation to delinquency. The first goal was to investigate what the magnitudes of these associations are and which of these have the strongest relationships with delinquent behavior. The second purpose was to analyze potential moderators of the parenting–delinquency link and their relative importance.

This meta-analysis confirms that parenting is related to delinquency. We found significant links between all parenting dimensions and delinquency but the magnitude of the relation depended on the particular parenting dimension. The strongest links were found for psychological control ( $ESr=0.23$ ) and the weakest links were found for authoritative and authoritarian control ( $ESr=0.12$ ). Analyzing discrete parenting behaviors (i.e., subcategories within parenting dimensions) revealed that differences were even larger. The strongest mean effect sizes were found for negative aspects of support such as neglect, hostility and rejection or combinations of these parenting behaviors ( $ESr$  ranges from 0.26 to 0.33). In addition, parental monitoring, either active monitoring by parents, parental knowledge or child disclosure, was relatively strongly linked to delinquency ( $ESr$  ranges from  $-0.23$  to  $-0.31$ ). These results are in accordance with the finding of Loeber and Stouthamer-Loeber (1986) that parental rejection and poor supervision were among the best predictors of delinquency. Furthermore, moderate effect sizes were found for psychological control and overprotection ( $ESr$  ranges from 0.21 to 0.23). The smallest effect sizes were found for communication ( $ESr=-0.07$ ), permissiveness ( $ESr=0.09$ ), and physical punishment ( $ESr=0.10$ ). Parenting accounted for up to 11% of the variance in delinquency.

The magnitude of the effect sizes ranged from small to moderate. It should be noted that even small effect sizes, such

as the link between authoritarian control and delinquency can have substantively important consequences. The practical importance of a correlation can be shown in a Binomial Effect Size Display (BESD, McCartney and Rosenthal 2000). For example, consider a group of 200 youngsters of which half of these youngsters have authoritarian parents and half do not. A correlation of 0.12 can be displayed as follows: 44% of the youngsters without authoritarian parents versus 56% of the youngsters with authoritarian parents show delinquent behavior. A correlation of 0.33 such as of the link between negative aspects of support (neglect, hostility and rejection) and delinquency can be displayed as follows: 67% of the youngsters with parents that adopt a rejecting and hostile attitude versus only 33% of the youngsters with parents who do not or hardly employ these seriously negative parenting behaviors will score high on delinquency. These are substantively important effects.

Given that both parenting dimensions of support and control were linked to delinquent behavior, parenting styles could be important risk factors for delinquency (that is, the combination of the dimensions support and control). In particular, a neglectful parenting style may be linked to delinquency (Maccoby and Martin 1983; Steinberg et al. 1994). Although hardly any studies were found on the link between a neglectful parenting style and delinquency, studies that measured parental neglect unidimensionally resulted in strong links between neglectfulness and delinquency ( $ESr=0.29$ ).

The results of this meta-analysis have implications for theories on parenting. Analyzing parenting dimensions, we found significant differences between various types of control including authoritative, authoritarian, behavioral and psychological control, with the highest effect sizes for psychological control. Based on these findings we agree with Barber et al. (1994) that it is useful to consider psychological control and nonpsychological assertive control (i.e. authoritarian control in this meta-analysis) as separate forms of control. However, contrary to the finding of Barber et al. (1994) that behavioral control rather than psychological control is responsible for increased levels of delinquency, we found that psychological control is at least as important as behavioral control. A possible explanation could be that we focused on delinquency including at least some serious offences, while Barber et al. (1994) focused on delinquency that included a relatively limited range of minor delinquent acts.<sup>4</sup> Nevertheless, our findings clearly indicate that psychological control, including keeping the

<sup>4</sup> Notice also that the number of items in the delinquency questionnaire moderated the link between psychological control and delinquency in our meta-analysis: the more items, the stronger the effect size.

child dependent and the use of guilt to control the child, elevates the risk for delinquent behavior.

Extremely negative behaviors such as rejection, neglect and hostility were linked to delinquency. Youngsters who experience rejection by significant others such as parents are at risk to develop distorted mental representations of themselves and their environment (Rohner 2004), which may explain why these youngsters are more likely to show delinquent behavior. The negative aspects of support had significantly stronger links to delinquency than a lack of support and warmth. These findings have implications for theories that model the support dimension of parenting as a continuum with one end referring to positive aspects such as warmth, affection and acceptance and the other end referring to the absence of these positive behaviors and the presence of negative aspects of support (e.g., Rohner 2004). The present meta-analysis shows that negative aspects of support have different links to delinquency than the positive aspects and therefore these concepts should be considered as separate parenting dimensions.

Poor parental monitoring was also relatively strongly linked to delinquency. The three indicators of parental monitoring, that is, parental knowledge of the child's whereabouts, the active tracking and tracing of the child's whereabouts by parents, and child disclosure, had links to delinquency that were relatively similar in magnitude. Stattin and Kerr (2000) suggested that the link between parental knowledge and delinquency can be explained by the child's disclosure of his or her activities and whereabouts, rather than actual tracking behavior by the parent. Actual monitoring by parents is probably limited, because adolescents spend less time with their parents and are relatively autonomous (Hirschi 1969; Nye 1958; Stattin and Kerr 2000). Therefore, we expected that the link between child disclosure and delinquency would be stronger than the link between poor parental monitoring and delinquency, however, the present meta-analysis revealed relatively similar effect sizes. Thus, both the child and the parent are active agents in the process of the link between knowledge on whereabouts of the child and delinquency.

In addition to theoretical implications, our results concerning the link between discrete parenting behaviors (monitoring, neglectfulness, rejection) and delinquency have implications for intervention and prevention policies focusing on delinquency, in particular parent management training programs. Programs should focus on training parents to actively monitor and guide their children in order to enhance parents' knowledge on the whereabouts of children. Although parent management training programs exist in many variations, typical trainings primarily do focus on improving parental discipline techniques and monitoring (Patterson 1982). Given that a large effect size was found for child disclosure, the emphasis in parent

trainings should also lay on improvements in the relationship and trust, given that this enhances disclosure. Furthermore, practitioners should be alert to parents who are neglecting and have a hostile and rejecting attitude towards their children, since combinations of these parenting behaviors are strongly linked to higher levels of delinquent behavior in youngsters. Translating the present results into a Binomial Effect Size Display (McCartney and Rosenthal 2000) suggests that if parent management training programs succeed in improving parenting practices, up to 33% of the youngsters of the successful parents may desist from delinquent behavior. Our finding concerning the significance of the link between parenting and delinquency is in line with studies that found support for the effectiveness of parent management training programs in reducing delinquency and antisocial behavior (e.g., McCart et al. 2006; Mulford and Redding 2008).

Sex-differences were found regarding the parenting–delinquency association. We found stronger links between poor support and delinquency in same-sex parent–child pairs. Poor support of father to sons and poor support of mothers to daughters were more strongly linked to delinquency than cross-gender supportive behavior by parents. An explanation could be that children have the tendency to identify with the same-sex parent (Laible and Carlo 2004), and a good relation with this parent serves as a protective factor against delinquency. We also found that poor *paternal* support was more strongly related to delinquency than poor *maternal* support. This finding may be particularly applicable to boys. Given the lack of studies that investigate fathers and that boys are more often delinquent than girls, there appears to be a serious gap in research. Our findings suggest that fathers may even have more influence on their sons' delinquency than mothers, supporting the contention that it is important to work with fathers when treating delinquency in boys. This is in line with a recent meta-analysis showing that children benefited more if fathers attended a parent training compared to programs that focused on mothers only (Lundahl et al. 2008).

Our findings from the moderator-analyses on age have important implications for the current debate between scholars from static versus dynamic theories on the causes of delinquent behavior (Hirschi and Gottfredson 2001; Sampson and Laub 2001a, b). In the present meta-analysis significant effects of age were found in cross-sectional studies on general parenting, indicating that correlates are not the same at all ages. This is in contradiction with assumptions of static models, but is in line with the dynamic models, such as the theory of Sampson and Laub (1993, 2005) suggesting that correlates of delinquency may change during the life-course. We found that the association between general parenting and delinquency was stronger in

school age children and early adolescents compared to mid and late adolescents. The parenting–delinquency link may weaken as children mature with the influence of peers or other life events having more impact. According to Sampson and Laub, changes in life circumstances are able to generate turning points in an individual’s criminal career. Delinquent behavior is inhibited during childhood and adolescence by bonds to the family and school. During (young) adulthood, social ties to labor or marriage and other turning points in life can modify trajectories of criminal offending. Thus, the findings in the present meta-analysis favor dynamic theories.

Different effect sizes were found depending on the informant about parenting. Studies in which the children reported on the level of authoritarian control found significantly stronger results than studies in which the parents were the informants or in which several different informants reported on this parenting dimension. We offer the following possible explanation for this finding. Children are more likely to indicate negative characteristics of their family, whereas parents tend to overestimate positive characteristics of their parenting behavior (Noller and Callan 1988). Additionally, dissimilar views of parents and children have been found to reflect stress and conflict and are associated with child maladjustment (Carlson et al. 1991). The stronger effect sizes for child report measures may be due to more negative views of youngsters who engage in delinquency and not to actual parenting differences *per se*. To our knowledge it is unknown which informants provide the most realistic information on parenting. These findings are important as the majority of studies rely on reports of children instead of parents (69% in the present meta-analysis) and only 3% of studies actually used observed parent–child interactions. Researchers collecting information on parenting should take the effects of different informants on parenting–delinquency associations into consideration when they interpret their findings and should control for social desirability of informants.

We found some evidence for significant methodological moderators. For example, the number of items in parenting and delinquency questionnaires did moderate the parenting–delinquency link. If questionnaires had relatively many items, stronger links were found between psychological control and delinquency. Also, stronger effects were found in studies that used more reliable parenting questionnaires. As expected, these findings indicate that if the quality of studies is higher, stronger links will be found between parenting dimensions and delinquency. Thus, these results demonstrate the importance of using reliable and validated questionnaires. Given that we included studies that ranged in quality, the mean effect sizes in this meta-analysis may be conservative.

## Limitations

It should also be noted that, for reasons of comparability, we focused on studies analyzing bivariate associations. Nevertheless, studies have been published that conducted multivariate analysis to test a prediction model for delinquent behavior. Multivariate analyses give insight to the unique contribution of parenting characteristics to delinquency by simultaneously controlling for other factors. However, meta-analyzing multivariate associations is problematic, because the effect size statistics of interest depend on what other variables are in the multivariate model (Lipsey and Wilson 2001). Multivariate models that are comparable across studies are rare. Further limitations of this meta-analysis are related to the poor availability of studies with specific characteristics. These gaps in research are discussed below.

## Gaps in Research

Unfortunately, as a result of the dearth of the studies that have actually examined parenting styles, we were not able to calculate mean effect sizes for various parenting styles. Future studies should extend research on parenting styles and delinquency in order to clarify whether these combinations of parenting characteristics have stronger associations with delinquency than only single dimensions. In particular, studies should include neglectful and permissive styles, and not only focus on authoritarian and authoritative parenting styles.

The vast majority of studies did not report separate effect sizes for different ethnic groups. Generally, studies only reported the percentage of several ethnic minority groups in the sample. Given that ethnic minority groups each may differ in style of parenting and in the prevalence of delinquency, analyzing ethnicity as a moderator would be of interest. In order to get insight into potential differences in the parenting–delinquency link between ethnic groups, it would be helpful if future studies would report effect sizes for each ethnic group.

The vast majority of studies (87%) had short time interval (less than 5 years) or were cross-sectional, which makes it difficult to get a clear picture of the longer term effects of parenting. Some previous studies, including time-intervals of at least 10 years suggest that parenting influences delinquent behavior in youngsters, but the influence of parents weakens over time (Hoeve et al. 2007, 2008). Further research is needed to provide information on parental correlates of delinquency across developmental levels. Most studies were focused on adolescents despite the fact that many models emphasize the role of parenting during childhood (e.g., Gottfredson and Hirschi 1990; Moffitt and Caspi 2001; Sampson and Laub 1993). Another reason for the need of additional longitudinal studies that cover a longer time span is to test typological theories of delinquency. For example, Moffitt



(1993) identified two types of offenders: life-course-persistent offenders, which originate early in life, and adolescence-limited delinquents, which begin around puberty. Life-course-persistent delinquents were found to be associated with poor parenting, whereas adolescence-limited delinquents were not (Moffitt and Caspi 2001). Given the assumptions of Moffitt and Caspi's taxonomy, one would expect to find stronger links between inadequate parenting and persistent offending than the parenting–delinquency links found in the present meta-analysis (i.e., delinquency at one point in time). Finally, longitudinal studies are needed to demonstrate whether or not parenting factors contribute to the continuation of offending after onset or for later onsets after age 20 (Farrington 2005).

From our meta-analysis it became clear that studies generally focus on one parent or both parents without differentiating between the sex of the parent (58% of the studies). The present meta-analysis, however, shows that it is worthwhile to compare studies on fathers with studies on mothers and their children. Future studies should make an effort to involve both fathers and mothers in their investigations and more clearly distinguish between father's and mother's reports on parenting when analyzing the link between parenting and delinquency.

The longitudinal studies included in our meta-analysis measured parenting at an earlier point in time than delinquency, hypothesizing that poor parenting leads to offspring delinquency. However, parents not only influence their children, but children also influence their parents (Crouter and Booth 2003; Granic 2000; Holden 1997). Most parents change their discipline practices if they notice that their child has committed a delinquent act (Kerr and Stattin 2003). Even though the included longitudinal studies showed that poorer parenting practices preceded delinquent behavior, a bidirectional view on parent–child relations cannot be rejected as we do not know whether the child-rearing characteristics had been influenced by earlier delinquency or other problem behaviors of the child. Thus, the direction of causal influence may run both ways. Therefore, we should not rule out that the link between parenting and delinquency may also be due to the impact of delinquency on parenting. If future longitudinal studies would test whether delinquency affects parenting, a meta-analysis could compare child and parent effects in the parenting–delinquency link.

The moderator analysis revealed that parental monitoring (at least knowledge and child disclosure) is relatively strongly linked to *overt* delinquency. We found that studies on overt delinquency, such as violent offences, found stronger links between poor child disclosure and parental knowledge on the child's whereabouts and delinquency than studies on covert delinquency, such as theft and arson. Moffitt and Caspi (2001) found that chronic offenders are

more likely to be engaged in overt delinquency and have more family-related problems than youngsters who show primarily covert delinquent behavior temporarily during adolescence. Therefore, parental monitoring may be an important predictor for persistent overt delinquency. However, this finding should be interpreted with caution as only three studies focused on parental knowledge, child disclosure and covert delinquency. Given that parenting may be differentially linked to overt and covert delinquency (see also, Loeber et al. 2008), future studies on delinquency should distinguish between overt and covert behaviors.

## Conclusions

This meta-analysis demonstrates that a significant relationship exists between parenting and delinquency and confirms previous research that behavioral control, such as parental monitoring is negatively linked to delinquency (Barber 1996; Patterson and Yoerger 1993). Moreover, this meta-analysis revealed that negative aspects of support including rejection, hostility and neglect and psychological control had the strongest links to delinquency. Furthermore, several indicators of parental monitoring, including parental knowledge, child disclosure, and active monitoring by parents, had similar links to delinquency.

Important study characteristics including sex of children and parents, age of the participants, delinquency type, and informant on parenting were significant moderators, indicating that some parenting dimensions are more crucial in particular situations or for particular subsamples. A lack of support had a relatively strong link to delinquency if that parent and child were the same sex. In addition, the parenting–delinquency link was stronger in school age children and early adolescents than in older adolescents. Furthermore, parental monitoring was more strongly linked to overt delinquency than covert delinquency, stressing the importance of distinguishing between different types of delinquency. Finally, larger effects were found when children reported on parenting than when parent self reports were used.

These findings have important implications for intervention and prevention policies focusing on delinquency. Interventions should not only focus on aspects of behavioral control such as restrictiveness, consistency in discipline, and monitoring, but should also target parenting dimensions such as psychological control and negative aspects of support. Furthermore, our findings suggest that fathers should be involved in intervention programs for violent youth, particularly interventions aimed at delinquent boys and if fathers themselves are not offenders. Finally, the finding that parenting is more strongly linked to delinquency in school age children and early adolescents, stresses the importance of prevention strategies early in life.

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## Appendix

**Table 5** List of Parenting Categories

Category	Parenting behaviors	Names and words in description
Parenting dimensions		
Support	Acceptance	Acceptance Feels wanted
	Affection	Affection Affective tie Hugs Loving Positive feelings Smiles Warmth
	Responsiveness	
	Sensitivity	
	Involvement	Involvement Attention Pay attention Care
	Parental trust	Confide Reliability Trust
	Understanding	
	Nurturance	
	Supportive parenting	Emotional support Instrumental support Support
	Praise	
	Open communication	Communication Quality of communication Communication (frequency) Intimate communication Open communication Parental self-disclosure Talks Instrumental communication
	Support positive (class)	Consists of more than one positive aspect of support (e.g., acceptance, involvement, and understanding)
	Avoidant offensive communication (–)	Avoidant communication Offensive communication Bad reaction to communication
	Underconcern (–)	Indifference Underconcern

**Table 5** (continued)

Category	Parenting behaviors	Names and words in description
	Neglectful (-)	Neglect Alienation Avoidance
	Rejection (-)	Rejection
	Hostility (-)	Hostility Anger Annoyance Irritation Sarcasm
	Anxious emotional involvement (-)	
	Cruel passive attitude (-)	
	Discouragement (-)	
	Support negative (class) (-)	Consists of more than one negative aspect of support (e.g., rejection and hostility)
Authoritative control	Rewarding	Noticing when doing good Positive parenting Rewarding Reinforcement
	Inductive parenting	Calmly discuss misbehavior Democratic Inductive parenting Reasoning
	Nonpunitive techniques	
	Authoritative control (class)	Consists of more than one aspect of authoritative control (e.g., rewarding, inductive parenting, and consistent discipline)
Authoritarian control	Harsh discipline	Firm control Harsh discipline
	Physical punishment	Beaten child up Hitting Kicking Physical power assertive discipline Slapping Threatening to hit Physical punishment Spanking
	Verbal aggression as punishment	Abusive name calling Aversive parenting Nagging Scolding Yelling Verbal attacks Control of anger toward child Shouting
	Punishment	Withdrawal of privileges Punishment Dominative parenting
	Reinforce aggression	
	Rigidity	
	Power-assertiveness	

**Table 5** (continued)

Category	Parenting behaviors	Names and words in description
Behavioral control	Unreasoning	
	Authoritarian control (class)	Consists of more than one aspect of authoritarian control (e.g., physical punishment, and inconsistent discipline)
		Poor discipline
		Authoritarian parenting (no style)
	Control	Control
		Discipline
	Rules setting	Rules management
		Rules setting
	Decision making	
	Restrictiveness	Demanding
	Demands for conformity	
	Restrictiveness	
	Monitoring	
	Supervision	
	Tracking of activities	
	Tracking of whereabouts	
	Checking homework	
	Consistent discipline	
	Consistent discipline	
	Follow-through	
	Inconsistent discipline (-)	
	Erratic	
	Inconsistent discipline	
	Uncertainty and confusion	
	Ignoring wrongdoing	
	Lax discipline	
	Permissiveness	
	Behavioral control (class)	
	Consists of more than one aspect of behavioral control (e.g., rules setting, restrictiveness, and permissiveness)	
Psychological control	Psychological control	Often interrupts child
		Tries to change feelings of child
		Psychological control
		Use of guilt to control child
		Emotional withdrawal
		Love withdrawal
		Ignoring as a form of punishment
		Overprotection
		Dependence
		Overprotection
	Intrusion	
	Protecting	
	Autonomy (-)	
	Autonomy	
	Psychological control (class)	
	Consists of more than one aspect of psychological control (e.g., psychological control and autonomy)	
General control	Control (class)	Consists of more than one control dimension (e.g., authoritarian control and behavioral control)
Parenting styles		
	General parenting	Consists of both support and control dimensions
		Parenting
		Inadequate parenting
		Effective parenting

**Table 5** (continued)

Category	Parenting behaviors	Names and words in description
		Parenting style
	Authoritative parenting style	Authoritative parenting
	Authoritarian parenting style	Authoritarian parenting
	Permissive parenting style	
	Neglectful parenting style	
Remaining categories		
Indirect parenting behavior	Knowledge	Knowledge Awareness Transfer of information from teen to parent Awareness of activities
Other parenting	Child disclosure	Child disclosure
	Problem-solving fairness	Unfair discipline Fair discipline
	Co-parenting	Agree on discipline Disagree on discipline
	Expectations	Negative expectations Expectations
	Spend time	

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