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Maternal and Paternal Parenting and Child Prosocial Behavior: A Meta-Analysis Using a Structural Equation Modeling Design

Lisa van der Storm[a], Caspar J. van Lissa[b], Nicole Lucassen[c], Katrien O. W. Helmerhorst[a], and Renske Keizer[a]

[a]Department of Public Administration and Sociology, Erasmus School of Social and Behavioral Sciences, Erasmus University Rotterdam, Rotterdam, the Netherlands; [b]Department of Methodology and Statistics, Utrecht University, Utrecht, the Netherlands; [c]Department of Psychology, Education and Child Studies, Erasmus School of Social and Behavioral Sciences, Erasmus University Rotterdam, Rotterdam, the Netherlands

ABSTRACT

The current meta-analysis examined and compared the relative associations of maternal and paternal parenting behavior with children's prosocial behavior from 29 studies. In total 502 effect sizes ($N = 14{,}627$) were subjected to Meta-Analytic Structural Equation Modeling. Controlling for the other parent, both maternal and paternal parenting behavior showed small positive pooled associations with children's prosocial behavior ($r_{father} = .10$ and $r_{mother} = .12$). The partial effect sizes for paternal and maternal parenting did not differ significantly from each other and were significant regardless of parenting dimension, study design (concurrent versus predictive) and average sample age (pre-adolescence versus adolescence). High levels of paternal and maternal warmth and positive control, and low levels of paternal and maternal harshness were associated with more prosocial behavior in children.

KEYWORDS

fathers; meta-analysis; mothers; parenting; prosocial behavior

It might be counterintuitive when looking at the biting, hitting, scratching, and screaming behavior of "the terrible two's" (Field, 2008), but the first signs of prosocial behavior already emerge shortly after children's first birthday (Warneken & Tomasello, 2006, 2007). Prosocial behavior can be defined as voluntary behavior intended to benefit another individual in response to emotional distress, material desire, or instrumental need. Concepts such as cooperating, comforting, sharing, supporting, helping, empathic and sympathetic behavior are considered as typical indicators of children's prosocial behavior (Dunfield & Kuhlmeier, 2013; Eisenberg, 2003). Understanding and identifying precursors of children's prosocial

CONTACT Lisa van der Storm vanderstorm@essb.eur.nl Erasmus School of Social and Behavioral Sciences, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR, Rotterdam, the Netherlands.

behavior is important because expressions of such behavior are related to important developmental outcomes, including peer acceptance, school performance, and low levels of loneliness and aggression (e.g., Eisenberg et al., 2015). Socialization theory posits that parents play a pivotal role in promoting prosocial behavior in their children (Bandura, 1986; Hoffman, 2000). Even though other socialization agents, such as peers, also influence children's prosocial behavior (Smetana et al., 2006), parents play an important (if not, the most important) role in the development of prosocial behavior from the beginning of children's lives (Steinberg & Silk, 2002), and continue to do so during adolescence (see Soenens et al., 2019, for a review).

Numerous studies, albeit mainly with a sole focus on mothers, have showed that parenting and children's prosocial behavior are related. With increasing awareness that "fathers are parents too" (Cabrera et al., 2018), a growing number of studies has investigated linkages between fathering and children's prosocial behavior. To date, however, no comprehensive meta-analysis has been conducted to assess the relative associations of each parent's parenting behavior with children's prosocial behavior. The current meta-analysis aimed to (a) examine and compare the relative associations of maternal and paternal parenting behavior with children's prosocial behavior, and (b) identify theoretical and methodological variables that moderate these linkages. Our meta-analysis is important for two reasons. First, valuable theoretical insights can be gained from exploring the relative associations of mothers' and fathers' parenting with children's prosocial behavior. As parenting is becoming more equally shared between fathers and mothers, it is important to examine whether paternal and maternal parenting behavior are similarly related to children's prosocial behavior. Second, knowledge about the relative importance of both fathers' and mothers' parenting behavior and the parenting dimensions that moderate the associations between mothers' and fathers' parenting behavior and children's prosocial behavior, will inform scholars and professionals about the importance of focusing on both paternal and maternal parenting behavior.

Parenting dimensions and children's prosocial behavior

Two broad strands of mechanisms can be used to explain how parenting behavior can endorse children's prosocial behavior: *modeling* of both parental warmth (e.g., sensitive and affective parenting) and harsh parenting behavior (Eisenberg et al., 2015), and the *internalization of prosocial values* via parental control (Hoffman, 2000).

Modeling of prosocial behavior

According to Bandura's (1986) social learning theory, modeling is fundamental to the learning of new behaviors. Parents who exert high levels of warm parenting behavior provide behavioral models to their children promoting affectionate and sensitive behavior (Grusec & Davidov, 2010; Grusec & Hastings, 2007). Parental warmth can be defined as emotional nurturance and affectionate caregiving toward children (MacDonald, 1992). Sensitive parenting, a more dyadic aspect of parental warmth, is the ability to perceive and interpret children's signals accurately, and in turn respond appropriately and promptly (Ainsworth et al., 1978). When children experience warm and sensitive parenting, they are more likely to model this behavior which can make them act less self-oriented and more likely to recognize and respond to others' desires and feelings (Hoffman, 2000). Conversely, children with parents that engage in harsh parenting are exposed to *anti*-social behavioral models. Harsh parenting can be defined as parental negative emotional affect and coercive acts such as name calling, threatening, yelling, slapping, spanking, or shoving (Chang et al., 2003; Patterson, 1982). Empirical evidence indicates that the mechanism of modeling applies to both warm (e.g., McCoy et al., 2009; Zhou et al., 2002) and harsh parenting behavior (e.g., Deater-Deckard et al., 2003; Gryczkowski et al., 2018; Padilla-Walker et al., 2016; Williams & Berthelsen, 2017).

Internalization of prosocial values

In addition to modeling, parenting behavior, and in specific parental control, shapes children's prosocial behavior via the internalization of prosocial values. Behavioral control refers to parents' regulation of their children's behavior, for example through monitoring, rule setting, and supervision (Barber, 1996; Stolz et al., 2005). Compared to warm and harsh parenting behavior, the link between parental control and prosocial behavior is thought to be more complex and could go in different directions, depending on the level or extent of harshness, strictness, form, and (in)consistency of parental control (Spinrad et al., 2019). Hoffman (2000) theorized that parental control strategies using parental reasoning and induction (i.e., positive behavioral control) promotes children's internalization of values and self-regulatory capacities. Positive behavioral control does not only endorse prosocial behavior by providing a model of care and nurturance, it also enhances children's attendance and learning of parental messages that can be associated with helping and caring behavior. Indeed, high levels of prosocial behavior in children are commonly associated with positive behavioral control (e.g., Farrant, Devine, Maybery, & Fletcher, 2012; Hart, Newell, & Olsen, 2003; Knafo & Plomin, 2006).

In contrast, when parental control is inconsistent, children are less able to foresee future consequences and are more likely to engage in anti-social or transgressive behavior (Bandura, 1986; Stouthamer-Loeber & Loeber, 1986). Inconsistent discipline is characterized by parents' lack of follow-through of conduct and rules, and unpredictability in the administration of punishment or other negative consequences (Chamberlain & Patterson, 1995). In addition, prosocial behavior is not likely to be adopted by children when parents use overly strict or even manipulating techniques (i.e., psychological control) because children attribute prosocial behavior to external motives, rather than that they internalize it (Dix & Grusec, 1983; Smith et al., 1979). Psychological control is referred to as parenting behavior that intrudes children's thoughts and feelings by the use of manipulative techniques such as guilt-induction, shaming, and love withdrawal (Barber, 1996). Such parenting behavior interferes with children's need for psychological autonomy and makes children feel forced to think or act in ways imposed by their parents (Soenens & Vansteenkiste, 2010), which in turn might diminish other-oriented behavior (Hoffman, 2000). Empirical results indeed showed negative associations between children's prosocial behavior and negative behavioral control such as excessive, inadequate, or inconsistent behavioral control (e.g., Gryczkowski et al., 2018) and parental psychological control (e.g., Kuppens et al., 2009).

Mothers' and fathers' parenting and children's prosocial behavior

Parenting research has typically focused on questions regarding what mothers do with, and for, their children, and what influence maternal involvement has on children's development. Research on children's prosocial behavior has not been an exception to this pattern (e.g., Eisenberg et al., 2019; Farrant et al., 2012; Kochanska et al., 1999). The importance of father involvement only came into focus in the early 1970s (Lamb & Lewis, 2013). At that time, paternal involvement was mainly operationalized in terms of co-residence: fathers' presence in the child's household. Later, scholars refined the definition of father involvement, defining it in terms of time spent with the child, regardless of the type of activities undertaken. Little evidence was found, however, for a significant link between fathers' total amount of time spent with children (labelled as absolute involvement) and child development. Subsequently, fathering research gradually shifted toward conceptualizing father involvement as father's direct engagement with the child, through caretaking and other shared activities that might potentially promote child development (Pleck, 2007). Consequently, research on children's prosocial behavior also started to examine fathers' contributions to children's prosocial behavior (e.g., Burbach et al., 2004;

Flouri, 2008; Hessel et al., 2017). Unfortunately, however, most of these studies focused exclusively on fathers' contribution to children's prosocial behavior. Although insightful, these studies still missed out on the notion that parent-child relationships do not exist in a vacuum but are instead contingent on other family relationships (e.g., Cabrera et al., 2014). Families are an integrated system of subsystems in which *both* fathers and mothers contribute to children's development (Bronfenbrenner & Morris, 2007; Cabrera et al., 2014; Pleck, 2007). For an accurate understanding of how fathers' parenting is associated with children's prosocial behavior, it is important to account for mothers' parenting and vice versa. For this reason, in this meta-analysis, we solely include empirical studies that incorporated both mothers and fathers into their study design.

During the last 50 years, fathers have become more and more involved in parenting (Hook, 2006; Maume, 2008; Yeung et al., 2001). Although some scholars argue and show that certain roles might still be most prominent amongst solely mothers or fathers—for mothers the role of warm and nurturing caregiver, and for fathers the role of disciplinarian (Goldscheider & Popenoe, 1997) or rough-and-tumble playmate (Paquette, 2004)—the roles of fathers (and mothers alike) are increasingly being expanded (Cabrera et al., 2000), which have made fathers and mothers become more similar in their roles as caregivers (Fagan et al., 2014; Lamb & Lewis, 2010). Even despite the fact that some scholars construct a gender differentiated vision of *how* mothers and fathers parent, there is increasing consensus among scholars that there are little to no differences in how *well* mothers and fathers parent (e.g., Fagan et al., 2014). Given that the direction and strength of the association between parenting behavior and children's prosocial behavior likely differs by the parenting dimension studied, we argue that it is highly important to differentiate between these different dimensions of parenting behavior in order to be able to obtain an accurate understanding of similarities or differences in the strength of the associations between mothers' and fathers' parenting behavior and children's prosocial behavior. In the current meta-analysis, we will explore whether the strength of the associations between mothers' and fathers' parenting behavior and children's prosocial behavior differ across these parenting dimensions.

Moderators

In the current meta-analysis, we will include parental warmth, harshness and control as theoretical moderators of the link between parental behavior and children's prosocial behavior. In addition, we will examine a number of methodological moderators. First, the average age of children in the

sample might be relevant. In early childhood, the association between parenting behavior and prosocial behavior is relatively strong because at this age parents are the most important socialization figures (Steinberg & Silk, 2002). The older children get, the more independent they become from their parents, and the more contact they have with other socialization figures (e.g., peers) (Smetana et al., 2006). Therefore, the association between parenting behavior and children's prosocial behavior might vary as a function of age. Second, it has been suggested that associations between parenting behavior and children's prosocial behavior are stronger for daughters than for sons (Hastings et al., 2005; Hastings, Utendale, et al., 2007). Hence, studies with a higher percentage of girls might report stronger effect sizes compared to studies with a higher percentage of boys. Third, with regard to the study design, cross-sectional effect sizes (i.e., concurrent studies) may show stronger effect sizes than longitudinal effect sizes (i.e., predictive studies), as concurrent associations are possibly based on bidirectional effects and the effect of parenting on children's prosocial behavior may dissipate over time (Adachi & Willoughby, 2015). Finally, the sample's socio-economic status (SES) and country of origin are relevant as possible moderators. With regard to SES, based on previous research conflicting expectations can be formulated. On the one hand, higher SES parents might be better able to adjust their behavior to the needs of their children (Kalil et al., 2012). On the other hand, high quality parenting might have stronger effects in low SES families, precisely because other resources are often missing from these children's lives (McWayne et al., 2013). Concerning the country of origin, there is evidence that levels of prosocial behavior vary across countries (e.g., Feygina & Henry, 2015; Mesurado et al., 2014), which could imply that associations between parenting behavior and children's prosocial behavior vary because of different cultural expectations concerning children's prosocial behavior and the role that parents play therein.

Present study

Although theory assumes a causal effect of parenting behavior on children's prosocial behavior, we refrain from causal language in the empirical part of this study, as this meta-analysis could not rely on a sufficient number of studies with an experimental study design to be able to draw conclusions about the direction of causality. As such, we merely focus on associations between parenting dimensions and children's prosocial behavior. In the current meta-analysis, we set out to examine and compare the strength of the associations between mothers' and fathers' parenting behavior and children's prosocial behavior. To our knowledge, this is the first meta-

analysis that synthesized findings from empirical studies on associations between maternal and paternal parenting behavior and children's (0–18 years old) prosocial behavior in heterosexual two-parent families. In a regular meta-analysis, one can compare the correlations of fathering and mothering with children's prosocial behavior. However, when using bivariate correlations, one cannot control for the contribution of the parenting behavior of the other parent. Parenting behavior of fathers and mothers is often moderately to strongly positively correlated (Pleck, 2010; Pleck & Masciadrelli, 2004), indicating that when father displays high levels of a certain type of parenting, it is likely that his partner is also engaging in higher levels of this type of parenting (and vice versa). Meta-Analytic Structural Equation Modeling (MASEM; Cheung, 2008, 2015; Jak, 2015) allows the inclusion of pooled associations between paternal parenting and children's prosocial behavior, between maternal parenting and children's prosocial behavior, and between paternal and maternal parenting behavior. By including both paternal and maternal parenting behavior within the same model, we are able to assess the relative association of fathers' and mothers' parenting behavior with children's prosocial behavior across studies. Our meta-analysis will not only provide clarity about the relative associations of mothers' and fathers' parenting behavior with children's prosocial behavior, and the extent to which the strength of these associations differs for mothers and fathers, but also shed light on how these associations differ by the parenting dimensions parental warmth, harshness, and control. Based on literature, we formulated the following hypotheses.

Parenting and children's prosocial behavior

We expected that across studies, both higher quality of fathers' and mothers' parenting would be significantly associated with higher levels of children's prosocial behavior [H1]. Furthermore, we explored whether pooled association strength between parenting behavior and children's prosocial behavior differed between fathers and mothers.

Parenting dimensions and children's prosocial behavior

With regard to three dimensions of parenting behavior, we hypothesized that across studies, high levels of warm parenting behavior [H2a] and low levels of harsh parenting behavior [H2b] would be positively associated with children's prosocial behavior. In addition, we expected that positive parental control (i.e., not overly strict, accompanied by reasoning and induction) and low levels of negative parental control (i.e., manipulating, overly strict or inconsistent) would be positively associated with children's

prosocial behavior [H2c]. We also explored whether the association strength between the parenting dimensions and children's prosocial behavior differed between fathers and mothers.

Moderators

Concerning the additional moderators, we hypothesized that (i) samples consisting of younger children (compared with samples consisting of adolescents) [H3a], (ii) studies with concurrent designs (compared with predictive designs) [H3b], and (iii) samples with a higher percentage of girls (compared to boys) would reveal stronger associations between parenting behavior and children's prosocial behavior [H3c]. Finally, we explored moderator effects of SES composition and country of origin of the studies, as well as differences in association strengths between fathers and mothers for each of the five moderators (child age, child sex, SES composition in sample, study design, and country of origin).

Method

Literature search

The literature search for our meta-analysis was conducted using five electronic databases: Scopus, PsycINFO, Pubmed, Web of Science, and Educational Resources Information Center. The initial search was performed in January 2019 and updated in July 2019. We constrained the search to peer-reviewed articles written in English, with no cultural, geographical, or publication date restrictions. Studies had to use at least one of the following search terms in the title, abstract, and/or keywords for each of the following concepts: (I) prosocial behavior, (II) parenting behavior, (III) parent-child interaction. The syntax for the search terms was constructed in collaboration with the university library of the Erasmus University Rotterdam.

I. Search terms for type of prosocial behavior were *prosocial** or *comforting* or *cooperating* or *helping* or *sharing* or *supporting* or *empath** or *sympath**. These terms had to be combined with the following key words indicating behavior (i.e., behavior* or behavior*) and the keyword *child**.
II. Search terms indicating the type of parenting behavior were *socialization* or *warmth* or *sensitiv** or *insensitiv** or *responsiv** or *affect* or *support* or *involvement* or *monitor* or *control** or *overprotect** or *intrusiv** or *autonom** or *disciplin** or *hostil** or *positive** or *negativ** or *harsh* or *punish* or *acceptance* or *reject** or *skill or synchron** *or rearing*. In

addition, search terms indicating parenting styles (i.e., *permissive* or *authoritative* or *authoritarian* or *neglect*)* were included because in some studies authors used specific parenting behaviors to construct scores for different parenting styles. As such, measures of parenting styles were mentioned in the abstract and thus added to our syntax.

III. Search terms indicating the parent-child interaction (i.e., *parent** or *"parent-child relation*"* or *"parent-child interact*"* or *"parent child relation*"* or *"parent child interact*"* or *caregiv*).* As the focus of the current meta-analysis was on fathers *and* mothers, the term had to be combined with a paternal dimension (i.e., *father** or *paternal*) and a maternal dimension (i.e., *mother** or *maternal*).

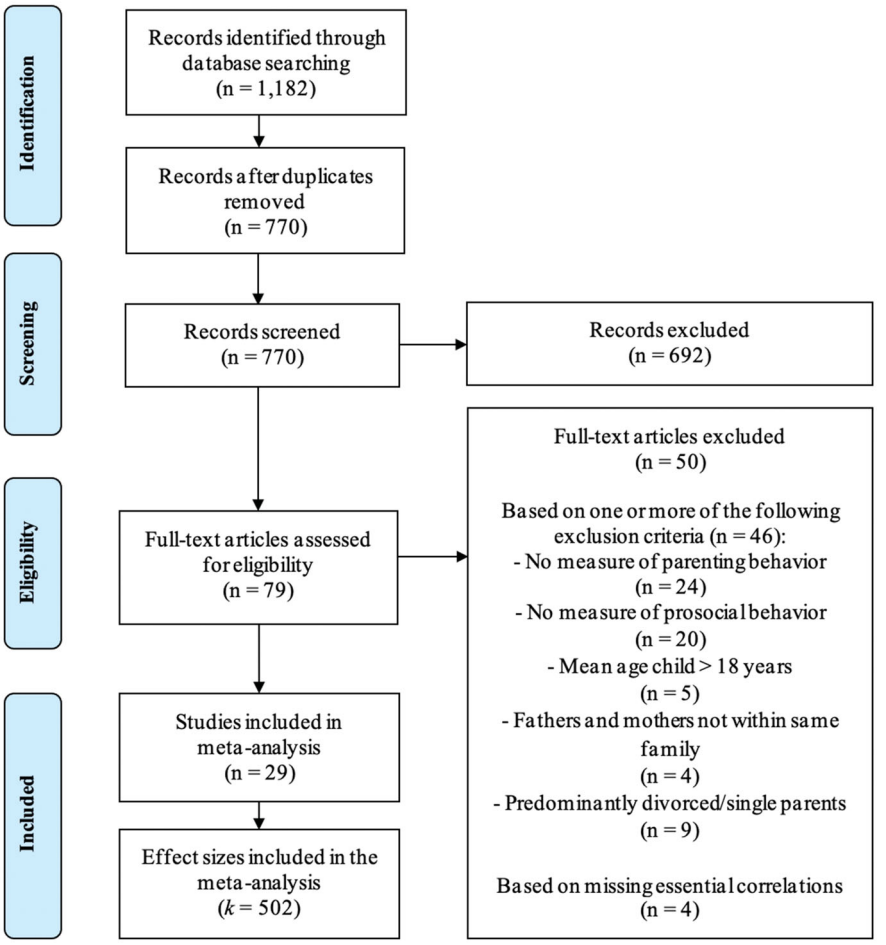

Figure 1. PRISMA flow chart of the systematic search including n = number of studies, k = number of effect sizes.

Inclusion and exclusion criteria

In total 770 unique hits were detected with our search terms (see Figure 1 for the PRISMA flow chart). We proceeded with a global screening of titles and abstracts for the presence of (1) measurements of parenting behavior for both fathers and mothers, and (2) measurements of prosocial behavior in children, (3) in non-clinical samples, which resulted in a total of 79 articles. Studies including parents or children with clinical diagnoses were excluded, because parenting behavior and children's prosocial behavior may be non-normative in clinical samples. To minimize discrepancies between study samples included in this meta-analysis, we assessed these 79 articles for eligibility based on the following four inclusion criteria: First, the children's mean age in the sample was between 0 and 18 years old. Second, measures of prosocial behavior entailed children's cooperating, comforting, sharing, supporting, helping, empathic or sympathetic *behavior*; attitudes (such as empathic reasoning and sympathetic feelings) were not included. Third, studies included specific parenting behaviors rather than broader concepts of parenting styles. In case studies used parenting behaviors to construct parenting styles but did not report separate correlations for the specific parenting behaviors, authors were contacted and requested to provide the correlations for each separate parenting behavior. Fourth, the same parenting constructs were assessed for both fathers and mothers. Studies were excluded if they did not meet one or more of the inclusion criteria ($n = 46$, see Figure 1). Finally, if none of the relevant correlation coefficients were available in the published manuscript and the author(s) of this manuscript did not respond to our email request to provide them, we excluded these studies from the meta-analysis ($n = 4$). In total, 29 studies were included in the meta-analysis, see Table 1 for an overview of the studies.

Coding the studies

The included studies were coded on parenting behavior, prosocial behavior, study and sample characteristics, and effect sizes by three of the authors with extensive experience in observing and coding parent-child interactions. A subset of 20% studies was double coded by two of the authors and showed high inter-coder reliability for the correlations between parenting behavior and children's prosocial behavior (ICC = 0.99), correlations between maternal and paternal parenting behavior (ICC = 0.99), and full agreement for the labels of parenting behavior, sample size, mean age, percentage boys, and study design (i.e., concurrent or predictive).

Table 1. Study characteristics and assigned parenting dimension of the included studies in this meta-analysis.

Study	*k*	Study design	Country	*N*	Parenting dimension	Informant parenting	Informant prosocial behavior
Bar-Tal et al. (1980)	8	Concurrent	IL	153	Warmth, harsh	Child	Child
Blair and Perry (2019)	4	Predictive	US	955	Sensitivity	Parent	Mixed
Carlo et al. (2018)	24	Predictive	US	462	Warmth, harsh, inconsistent discipline, behavioral control	Child	Child
Chaparro and Grusec (2016)	4	Predictive	CA	111	Harsh, inconsistent discipline	Parent	Mixed
Daniel et al. (2016)	24	Combination	CA	381	Warmth	Parent	Parent
Davidov and Grusec (2006)	12	Concurrent	CA	106	Sensitivity, Warmth	Parent	Mixed
Deković and Janssens (1992)	12	Concurrent	NL	112	Warmth, sensitivity, behavioral control, harsh	Parent	Mixed
Eberly et al. (1993)	12	Concurrent	US	84	Warmth, psychological control, behavioral control	Child	Parent
Gryczkowski et al. (2018)	8	Concurrent	US	129	Behavioral control, harsh, inconsistent discipline	Parent	Child
Guevara et al. (2015)	2	Concurrent	CO	239	Behavioral control	Parent	Child
Guo and Feng (2017)	4	Concurrent	CH	494	Warmth, harsh	Child	Child
Hart et al. (1992)	2	Concurrent	US	106	Behavioral control	Parent	Observed
Hastings et al. (2007)	16	Predictive	CA	133	Warmth	Parent	Mixed
Kuppens et al. (2009)	6	Concurrent	BE	588	Behavioral control, support, psychological control	Mixed	Mixed
Lansford et al. (2018)	6	Combination	Multi	1,298	Warmth, behavioral control	Parent	Parent
Lux and Walper (2019)	12	Combination	DE	372	Inonsistent discipline	Parent	Child
Mccoy et al. (2013)	6	Predictive	US	235	Warmth, inconsistent discipline, psychological control	Mixed	Mixed
Newton et al. (2014)	8	Combination	US	1155	Sensitivity	Observed	Mixed
Padilla-Walker et al. (2016)[O]	60	Predictive	US	500	Warmth, harsh	Mixed	Mixed
Padilla-Walker and Son (2019)[O]	72	Combination	US	463	Warmth	Mixed	Mixed
Padilla-Walker et al. (2013)[O]	6	Predictive	US	325	Warmth, behavioral control	Parent	Child
Putnick et al. (2015)[O]	10	Combination	Multi	1,247	Warmth	Child	Child
Putnick et al. (2018)[O]	12	Combination	Multi	1,144	Warmth	Parent	Child
Van Berkel, Groeneveld, et al. (2015)[O]	2	Concurrent	NL	388	Sensitivity	Observed	Observed
Van Berkel, Van Der Pol, et al. (2015)[O]	4	Concurrent	NL	302	Sensitivity	Observed	Observed
Williams and Berthelsen (2017)	4	Predictive	AU	4,007	Warmth, harsh	Parent	Teacher
Xing et al. (2017)	2	Concurrent	CH	325	Psychological control	Parent	Mixed
Zarra-Nezhad et al. (2014)	18	Concurrent	FI	314	Warmth, behavioral control, psychological control	Parent	Teacher
Zarra-Nezhad et al. (2018)	16	Combination	FI	200	Warmth, behavioral control	Parent	Parent

Note. *k*: number of effect sizes; *N*: total number of children in sample; IL: Israel; US: United States; CA: Canada; NL: The Netherlands; CO: Colombia; CH: Switzerland; BE: Belgium; DE: Germany; AU: Australia; FI: Finland.
[O]Overlapping sample.

Parenting and prosocial behavior

For both parenting behavior and children's prosocial behavior, we coded the assessment method (i.e., observation or questionnaire) and informant(s) for each included article. In addition, we coded which parenting behavior(s) was/were assessed in the study, generating an extensive list of constructs of parenting behavior (e.g., sensitivity, autonomy support, behavioral control, monitoring, hostility, psychological control etc.). In the next step, the authors discussed the different parenting behaviors and assigned these to six overarching parenting constructs: warmth, sensitivity, inconsistent discipline, psychological control, behavioral control and harsh parenting.

Because the number of studies for each of the six parenting constructs was not sufficient for separate moderation analyses, we decided to combine the six different parenting behaviors into overarching parenting dimensions. Each of the six parenting constructs were assigned to one of three parenting dimensions as discussed in the introduction: (a) parental warmth (i.e., parental warmth and sensitivity); (b) positive parental control (i.e., high levels of positive behavioral control, and low levels of psychological control and inconsistent discipline); and (c) harsh parenting. In order to obtain scores of positive parental control, associations of studies reporting on negative parental behavioral control (i.e., strict/negative behavioral control, psychological control, and inconsistent discipline) were recoded in the opposite direction so that all measurements within the dimension of positive parental control would represent either *positive* behavioral control, or low levels of *negative* behavioral control. Finally, to allow us to assess the overall associations between parenting behavior and children's prosocial behavior, we recoded all associations of harsh parenting with children's prosocial behavior in the opposite direction as well. From this point on, we therefore refer to *low levels* of harsh parenting instead of harsh parenting.

Study and sample characteristics

We coded the following study characteristics, country of data collection, sample size, sex composition (i.e., percentage of boys), age of child at the time of the assessment of prosocial behavior, and whether the independent variable (i.e., parental behavior) and the dependent variable (i.e., prosocial behavior) were measured cross-sectionally or longitudinally. Considering we were primarily interested in cross-sectional associations and most of the included measurements were concurrent (i.e., independent and dependent variable measured at same time point), we decided to include concurrent correlations coefficients instead of predictive coefficients where both were available. For studies with only predictive waves, we included correlations between parenting and prosocial behavior at predictive waves (where

prosocial behavior always had to be measured in the subsequent wave). For each study, we coded whether the study design was concurrent or predictive.

Effect size

The effect size of interest was Pearson's product-moment correlation coefficient (*r*). We aimed to code three effect sizes for each study: (I) the correlation between paternal parenting and children's prosocial behavior; (II) the correlation between maternal parenting and children's prosocial behavior; (III) correlation between paternal and maternal parenting behavior. Additional effect sizes per study were coded when the following criteria were met: (a) associations between constructs were measured at multiple time points (e.g., parenting behavior and children's prosocial behavior were assessed at 4, 5, and 6 years old); (b) different dimensions of parenting behavior (e.g., parental warmth, parental hostility etc.) were reported; (c) different dimensions of prosocial behavior were examined (e.g., sharing, cooperation, comforting etc.); (e) different measurement instruments (e.g., observations, questionnaires, interviews etc.) were used to assess the construct; (f) different reporters (e.g., child-report, parent-report, teacher-report etc.) were used to assess the construct; (g) associations between constructs were examined for boys and girls separately and there was no overall effect size available. Authors were contacted by email with a request to send additional information if essential information (e.g., target correlation, sample size) was not reported. In total we approached 16 authors, of which 8 provided us with the requested material. When authors did not respond to our email request, non-available correlations were coded as missing. Only available correlation coefficients were pooled for analyses. If none of the relevant correlation coefficients were available, we excluded these studies from the meta-analysis.

Statistical analysis

All analyses were conducted in R (R Core Team, 2019). We used meta-analytic structural equation modeling (Cheung, 2015), to examine relative associations of maternal and paternal parenting behaviors with children's prosocial behavior. Following the two-stage procedure (see also Cheung, 2015), we first pooled correlations across studies, and obtained the asymptotic sampling covariance matrix using the R-package "clubSandwich" (Pustejovsky, 2019). Some studies reported analyses on the exact same sample, and most studies reported multiple relevant effect sizes. The data were thus treated as nested, with effect sizes nested within samples. We used robust variance estimation with bias-reduced linearization adjustment to

account for nonindependence of effect sizes within samples (Fisher & Tipton, 2015; Pustejovsky & Tipton, 2018). Using the sample ID as the unit of analysis allowed us to include all relevant effect sizes reported in primary studies, while dealing with the interdependency between included effect sizes (Assink & Wibbelink, 2016). The produced parameter estimates represent zero-order correlations among the study constructs corrected for sampling error across studies.

Using the "metafor" package in R (Viechtbauer, 2010), conventional random-effects meta-analytic estimates, 95% confidence intervals, 95% prediction intervals, and homogeneity statistics were computed for each correlation. The current study conducted a random-effects analysis, because it can be assumed that the true underlying effects are different, yet related, across studies. Random effect models account for variation in the effect sizes of included studies, as the studies are no exact replications of each other and therefore heterogeneous (Cheung, 2008). Random effects models are considered to be the standard method for systematic reviews, with meta-analyses on exact replication studies as exceptions to this standard as the latter start from the assumption that all studies share a common effect size (and therefore fixed effect models are used) (Borenstein et al., 2010).With regard to the heterogeneity statistics, τ^2 represents the variance of the distribution of true effect sizes, and Higgins' and Thompson's (2002) I^2 represents the percentage of variability in the effect sizes not caused by sampling error. For the interpretation of I^2 a rule of thumb can be used where $I^2 = 25\%$ indicates a low heterogeneity, $I^2 = 50\%$ a moderate heterogeneity, and $I^2 = 75\%$ a substantial heterogeneity. Finally, a statistically significant Cochran's (1952) Q value indicates a substantive heterogeneity, but it is important to note that Q is highly dependent on the size of the meta-analysis. In the second stage, a saturated SEM-model was fit to the pooled correlation matrix using the R-package "metaSEM" (Cheung, 2015). Figures and tables for the SEM-models were generated using "tidySEM" (Van Lissa, 2020).

Moderator analyses

We examined whether the three parenting dimensions (i.e., parental warmth, harsh parenting, and positive parental control) moderated the effects of maternal and paternal parenting on children's prosocial behavior. In a similar way, we assessed the following study and sample characteristics as possible moderators of the effects of maternal and paternal parenting on children's prosocial behavior: study design, sex composition (i.e., percentage of boys), average sample age, SES composition, and country of origin of the sample. Because two-stage metaSEM can only accommodate categorical predictors, continuous moderators were categorized. The effect of

moderators was examined by conducting multiple-group analyses, with the moderator as a grouping variable. Difference parameters were computed between model parameters in the different groups, and the significance of these difference parameters was assessed based on confidence intervals.

Sex was eliminated as a potential moderator, because the majority of studies had a near-fifty-fifty sex distribution. Only four studies had a sex composition consisting of subsamples of all girls and all boys, which was not enough, and possibly a too selective subsample to run separate analysis with. As such, there was not enough variation in our data to assess to what extent linkages between parenting behavior and children's prosocial behavior differed by the sex distribution of the study. The SES composition and the sample's country of origin were also eliminated as potential moderators, given that the samples consisted predominantly of middle/higher class families and Western origin. As such, there was not enough variation in our data to assess to what extent the linkages between parenting behavior and children's prosocial behavior differed by the SES composition or country of origin of the study. However, there was substantial variance in average sample age across studies. To categorize this continuous variable we used the R-package "tidyLPA" (Rosenberg et al., 2018) to conduct latent class analysis. A two-class solution had a better fit than a one-class solution and led to a near equal split of the sample. A three-class solution had only five studies in one of the classes. Therefore, we opted for the two-class solution, and classified cases based on the highest posterior model probability (entropy = .74). Fourteen studies had participants in pre-adolescence (i.e., early and middle childhood; *M*age = 6.89, *SD* = 5.00) and 14 studies had participants in adolescence (*M*age = 13.11, *SD* = 5.00). Finally, we created a variable—yielding two subsamples—indicating whether or not there was a time lag between the independent and dependent variables (i.e., concurrent or predictive).

Publication bias

Since significant results are more likely to be published than nonsignificant results (i.e., the file drawer effect, Rosenthal, 1979), not including unpublished data in a meta-analysis might lead to an overestimation of effects. The alternative, including unpublished findings, unfortunately, comes with its own challenges. First of all, it is highly unlikely that one is able to include all unpublished findings (see for a discussion the meta-analysis of Weeland et al. (2019). Second, and related to the first issue, the unpublished findings that can be included are likely substantially biased. Ferguson and Brannick (2012) showed that in the field of Psychology, meta-analyses including unpublished studies were actually more likely to show bias compared to studies who did not. The authors suggested that

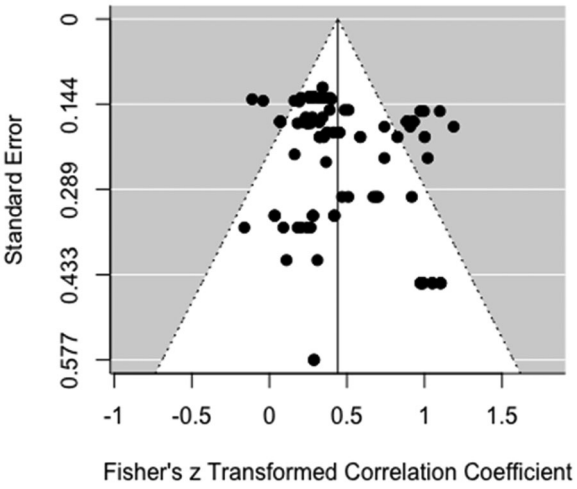

Figure 2. Funnel plot containing the effect sizes for parenting behavior—children's prosocial behavior.

this is likely due to selection bias in unpublished literature searches. In addition, given that reports on procedures and methods are often less exhaustive and detailed in unpublished studies, it is more difficult to evaluate the validity of unpublished data (Cook et al., 1993). Based on these arguments, we decided to only include published peer reviewed studies in our meta-analysis and asses publication bias for each of the three core effect sizes separately, based on random effects meta-analyses of the Fisher's r-to-Z transformed correlations (Fisher, 1921). First, publication bias was assessed by examination of funnel plots (Figures 2 and 3) to check whether all studies lie symmetrically around the pooled effect size within the funnel-shape distribution. The studies showed an inverse funnel shape, where variance was greater for studies with smaller sampling errors (Figure 2). Publication bias is typically indicated when variance is greater for studies with larger sampling errors. Based on visual assessment of the funnel plot, we thus found no evidence for publication bias. Second, Egger's test (Egger et al., 1998) was used as a formal test of funnel asymmetry. Egger's test was significant for the correlations between mothers' and fathers' parenting behavior, indicating a relationship between effect size and the standard error. Again however, as the funnel shape was inverted, this relationship was in the opposite direction of what would be expected in the case of publication bias (Figure 3). Third, Duval and Tweedie's trim-and-fill procedure (Duval & Tweedie, 2000) was used to try to correct for the potential impact of publication bias. This analysis did not identify any studies to trim in the outlying regions of the funnel plot. In conclusion, none of the three analyses provided evidence of publication bias. Furthermore, we calculated the fail-safe sample size, defined as the number of studies

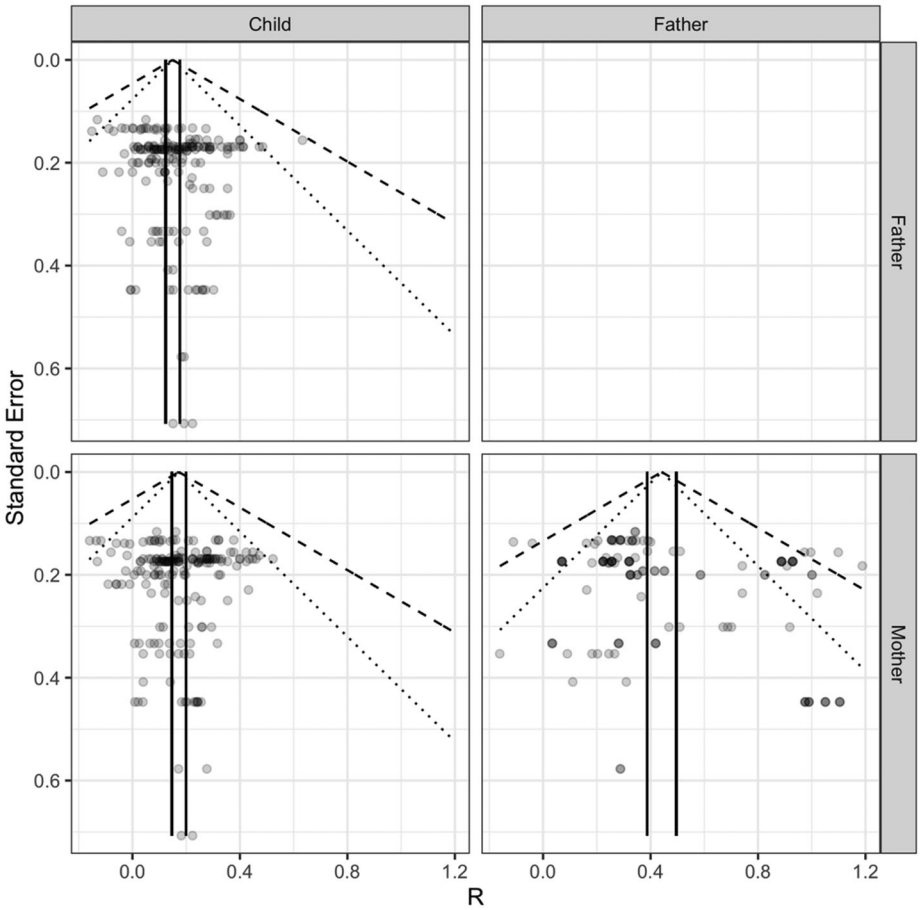

Figure 3. Funnel plots containing the effect sizes specifically for paternal parenting—children's prosocial behavior, maternal parenting—children's prosocial behavior, and maternal parenting—paternal parenting.

with no significant effect sizes that would need to be included to make the combined effect size statistically insignificant (Rosenthal, 1979). According to the classic fail-safe N test conducted across all effect sizes included in the current meta-analyses, it would take 10,257 studies yielding null results for the pooled association between mothers' parenting and child prosocial behavior to become nonsignificant, and 8,200 studies yielding null results for the pooled association between fathers' parenting and child prosocial behavior to become insignificant. As it seems extremely unlikely that this many unpublished studies with null results exist, we feel confident in concluding that the pooled associations reported in our study are trustworthy.

Results

The zero-order parameter estimates from the random effects model meta-analysis for associations of fathers' and mothers' parenting behavior with children's prosocial behavior are listed in Table 2. The analyses were based on 502 effect sizes from 187 unique father-child, 186 mother-child dyads, and 129 mother-father dyads from 29 studies, with a total sample size of 14,627 children. The sample sizes varied from 41 to 1,040 children between studies. The heterogeneity statistics reported in Table 2 indicate a moderate to substantial heterogeneity in our data for the total sample, as well as the subgroups. The only exceptions are the parameter estimates concerning associations between (low) harsh parenting and children's prosocial behavior, which are low in heterogeneity. Moreover, the 95% prediction intervals stretch slightly below zero. As the prediction interval indicates within which range the "observed" effect sizes of future research will probably fall, which is, the true effect size including sampling error, it is likely that the expected effect sizes are negative because of sampling error. Nevertheless, they could also imply that our conclusions based on the 95% confidence intervals may not hold in some settings (IntHout et al., 2016). Future research is encouraged to identify the specific context in which linkages between positive parenting and children's prosocial behavior may be negative, in contrast to the generally positive associations.

Within all the following MASEM analyses, we controlled for the pooled association between mothers' parenting behavior and children's prosocial behavior when assessing the pooled associations between fathers' parenting behavior and children's prosocial behavior, and vice versa. The pooled associations reflect the relative association of maternal and paternal parenting with children's prosocial behavior across studies, hereinafter referred to as *partial* associations or *partial* effect sizes. Within the context of a meta-analysis, controlling for pooled associations is similar to the standard control for each other's variables when using individual participant data. In the total set of 29 studies, the partial pooled effect size for paternal parenting behavior on children's prosocial behavior was significant, $r = .10$, $p < .001$, as well as for maternal parenting behavior, $r = .12$, $p < .001$, see Table 3 and Figure 4. This means that, while controlling for the pooled association between maternal parenting and children's prosocial behavior, fathers' parenting behavior was positively associated with children's prosocial behavior. Moreover, while controlling for the pooled association between fathers' parenting and children's prosocial behavior, maternal parenting was positively associated to children's prosocial behavior. This was in line with our first hypothesis that higher quality of parenting behavior would be associated with higher levels of children's prosocial behavior. Across

Table 2. Random effects model meta-analytic estimated pooled correlations (Pearson's R) for relationship between parenting behavior and children's prosocial behavior for fathers and mothers.

Moderator	#*k*	#ES	*N*	*r* (SE)	*p*	95% CI	95% PI	τ^2	I^2	*Q*	*Q p*
Total sample											
P Parenting–Prosocial Behavior	29	187	14,627	.16 (.01)	<.001	[.14, .18]	[−.05, .36]	.01	83.31	1182.06	<.001
M Parenting–Prosocial Behavior	29	186	14,627	.17 (.01)	<.001	[.16, .19]	[−.04, .39]	.01	84.56	1335.38	<.001
P Parenting–M Parenting	29	129	14,627	.41 (.02)	<.001	[.37, .45]	[−.06, .87]	.06	98.50	9376.84	<.001
Parenting Dimension											
P Control–Prosocial Behavior	16	45	4,450	.11 (.02)	<.001	[.08, .14]	[−.06, .27]	.01	72.01	141.58	<.001
M Control–Prosocial Behavior	16	45	4,450	.12 (.02)	<.001	[.09, .16]	[−.06, .31]	.01	76.93	185.53	<.001
P Control–M control	16	38	4,450	.45 (.03)	<.001	[.38, .52]	[.04, .87]	.04	97.96	1808.08	<.001
P Warmth–Prosocial Behavior	26	113	13,373	.19 (.01)	<.001	[.17, .21]	[−.01, .39]	.01	83.66	778.59	<.001
M Warmth–Prosocial Behavior	26	113	13,373		<.001	[.19, .23]	[.00, .42]	.01	85.40	872.28	<.001
P Warmth–M Warmth	26	66	13,373	.39 (.03)	<.001	[.33, .45]	[−.06, .85]	.05	98.32	5330.24	<.001
P Low Harsh Parenting–Prosocial Behavior	9	24	5,940	.09 (.01)	<.001	[.07, .11]	[.02, .16]	.00	36.11	38.69	.021
M Low Harsh Parenting–Prosocial Behavior	9	24	5,940	.11 (.01)	<.001	[.09, .13]	[.07, .15]	.00	14.40	28.65	.192
P Low Harsh Parenting–M Low Harsh Parenting	9	22	5,940	.42 (.06)	<.001	[.30, .54]	[−.15, .99]	.08	99.12	1750.31	<.001
Study design											
P Concurrent–Prosocial Behavior	22	79	7,745	.18 (.02)	<.001	[.15, .21]	[−.06, .42]	.01	85.79	598.56	<.001
M Concurrent–Prosocial Behavior	22	78	7,745	.19 (.02)	<.001	[.16, .22]	[−.04, .42]	.01	84.98	608.14	<.001
P Concurrent–M Concurrent	22	53	7,745	.38 (.03)	<.001	[.32, .44]	[−.05, .81]	.05	97.69	2364.97	<.001
P Predictive–Prosocial Behavior	16	108	10,429	.14 (.01)	<.001	[.12, .16]	[−.03, .32]	.01	79.40	533.98	<.001
M Predictive–Prosocial Behavior	16	108	10,429	.16 (.01)	<.001	[.14, .18]	[−.03, .36]	.01	83.48	669.71	<.001
P Predictive –M Predictive	16	76	10,429	.43 (.03)	<.001	[.37, .48]	[−.07, .92]	.06	98.81	6981.44	<.001
Age child											
P Pre-Adolescence–Prosocial Behavior	17	74	9842	.12 (.01)	<.001	[.09, .15]	[−.07, .32]	.01	79.73	394.09	<.001
M Pre-Adolescence–Prosocial Behavior	17	74	9842	.14 (.01)	<.001	[.11, .17]	[−.08, .35]	.01	82.85	475.48	<.001
P Pre-Adolescence –M Pre-Adolescence	17	65	9842	.37 (.03)	<.001	[.31, .43]	[−.07, .81]	.05	97.85	4795.64	<.001
P Adolescence–Prosocial Behavior	17	111	7,108	.18 (.01)	<.001	[.16, .20]	[−.02, .81]	.01	83.98	708.93	<.001
M Adolescence–Prosocial Behavior	17	110	7,108	.19 (.01)	<.001	[.17, .22]	[−.01, .40]	.01	84.63	800.68	<.001
P Adolescence –M Adolescence	17	62	7,108	.45 (.03)	<.001	[.39, .51]	[−.04, .94]	.06	98.87	4278.95	<.001

Note. P: paternal, M: maternal, *r*: Pearson's r correlation coefficient; 95% CI: 95% confidence interval; 95%PI: 95% prediction interval; τ^2: Tau-squared (between study variance); I^2: Higgin's & Thompson's I^2; *Q*: Cochran's Q; Q *p* : *p*-value of Q statistic.

Table 3. Estimated pooled partial associations (Pearson's R) for the relationship between parenting behavior and children's prosocial behavior for fathers and mothers using meta-analytic structural equation modeling.

Association	#*k*	#ES	*N*	*r* (*SE*)	95% CI	*p*
P Parenting–Prosocial Behavior	29	187	14,627	.10 (.01)	[.08, .13]	<.001
M Parenting–Prosocial Behavior	29	186	14,627	.12 (.02)	[.09, .15]	<.001
Δ Parenting				.02 (.02)	[−.02, .06]	.302
P Parenting–M Parenting	29	129	14,627	.37 (.05)	[.28, .46]	<.001

Note. P: paternal; M: maternal; Δ: difference in effect sizes for fathers and mothers; *#k*: number of studies; #ES: number of effect sizes; *N*: lower bound of the total number of participants; *r*: Pearson's r correlation coefficient; 95% CI: 95% confidence intervals of Pearson's *r* coefficient; *p*: *p*-value.

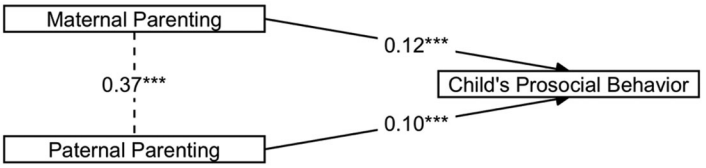

Figure 4. Conceptual model with relative pooled associations between mothers' and fathers' parenting behavior, and children's prosocial behavior. *Note*. ***p <.001.

studies, we explored differences in partial association strength between the mothers' and fathers' parenting behavior and children's prosocial behavior and our results suggest that this difference was small, and not significant, $\Delta r = .02$, $p = .302$, see Table 3.

Moderator analyses

Multi-group analyses were performed with the moderators parenting dimension (i.e., parental warmth, control, and harsh parenting), study design (i.e., concurrent versus predictive), and average sample age (i.e., pre-adolescence versus adolescence) as grouping variables. The partial effect sizes for both fathers and mothers for all three moderators are listed in Table 4, and a visualization of the comparison of partial effect sizes for all the grouping variables can be seen in Figure 5.

Parenting dimensions and prosocial behavior

In line with our hypothesis 2a, studies examining parental warmth showed a significant positive partial association with children's prosocial behavior for both fathers, $r = .13$, $p < .001$, as well as for mothers, $r = .14$, $p < .001$. In line with our hypothesis 2 b, across studies, low levels of harsh parenting were positive and significantly related to children's prosocial behavior for both fathers, $r = .11$, $p = .003$, and mothers, $r = .08$, $p = .003$. Concerning parental control, in line with our hypothesis 2c, after reversing correlations for studies that measure negative control, our results showed that across studies positive parental control (also including studies

Table 4. Estimated pooled partial associations (Pearson's R) for relationship between parenting behavior and children's prosocial behavior for fathers and mothers in different subsamples using meta-analytic structural equation modeling.

Moderator	#*k*	#ES	*N*	*r* (*SE*)	95% CI	*p*
Parenting dimension						
P Warmth–Prosocial Behavior	26	114	13,373	.13 (.02)	[.09, .17]	<.001
M Warmth–Prosocial Behavior	26	113	13,373	.14 (.02)	[.10, .19]	<.001
Δ Warmth				.01 (.03)	[−.04, .07]	.717
P Low Harsh Parenting–Prosocial Behavior	9	24	5,940	.11 (.04)	[.03, .17]	.003
M Low Harsh Parenting–Prosocial Behavior	9	24	5,940	.08 (.03)	[.02, .13]	.003
Δ Harsh Parenting				−.02 (.05)	[−.13, .06]	.666
P Control–Prosocial Behavior	16	45	4,450	.08 (.02)	[.03, .13]	<.001
M Control–Prosocial Behavior	16	45	4,450	.12 (.02)	[.07, .16]	<.001
Δ Control				.03 (.04)	[−.04, .11]	.423
Study Design						
P Concurrent–Prosocial Behavior	22	79	7,745	.11 (.02)	[.07, .16]	<.001
M Concurrent–Prosocial Behavior	22	78	7,745	.15 (.02)	[.11, .18]	<.001
Δ Concurrent				.03 (.03)	[−.02, .08]	.259
P Predictive–Prosocial Behavior	16	108	10,429	.08 (.01)	[.06, .11]	<.001
M Predictive–Prosocial Behavior	16	108	10,429	.12 (.02)	[07, .16]	<.001
Δ Predictive				.03 (.02)	[−.01, .08]	.206
Age Child						
P Pre-Adolescence–Prosocial Behavior	17	74	9842	.08 (.02)	[.05, .12]	<.001
M Pre-Adolescence–Prosocial Behavior	17	74	9842	.10 (.02)	[.05, .15]	<.001
Δ Pre-Adolescence				.02 (.03)	[−.03, .07]	.448
P Adolescence–Prosocial Behavior	17	111	7,108	.12 (.02)	[.08, .17]	<.001
M Adolescence–Prosocial Behavior	17	110	7,108	.15 (.02)	[.12, .18]	<.001
Δ Adolescence				.03 (.03)	[−.03, .08]	.275

Note. P: paternal; M: maternal; Δ: difference in effect sizes for fathers and mothers; *#k*: number of studies; #ES: number of effect sizes; *N*: lower bound of the total number of participants; *r*: Pearson's *r* correlation coefficient; 95% CI: 95% confidence intervals of Pearson's r coefficient; *p*: *p*-value.

that examined low levels of negative parental control) was significant and positively associated with children's prosocial behavior for fathers, $r = .08$, $p < .001$, as well as for mothers, $r = .12$, $p < .001$. Our results indicated that across studies, partial associations did not differ significantly between fathers and mothers with regard to parental warmth, $\Delta r = .01$, $p = .717$, low harsh parenting, $\Delta r = -.02$, $p = .666$, and positive parental control, $\Delta r = .03$, $p = .423$.

Study design and children's age

In addition to the moderator analysis for parenting dimensions, we assessed whether the partial effect sizes for concurrent versus predictive samples, and for pre-adolescence versus adolescence samples differed for fathers and mothers. It was expected that studies with concurrent samples (compared to predictive samples), and pre-adolescence samples (compared to adolescence samples) would show stronger effect sizes [H3a and H3b]. In contrast to our hypotheses, paternal and maternal parenting behavior was positively associated with prosocial behavior in children for both concurrent ($r_{father} = .11$, $p < .001$, $r_{mother} = .15$, $p < .001$) and predictive samples ($r_{father} = .08$, $p < .001$, $r_{mother} = .12$, $p < .001$), and for both pre-adolescence ($r_{father} = .08$, $p < .001$, $r_{mother} = .10$, $p < .001$) and adolescence samples ($r_{father} =$

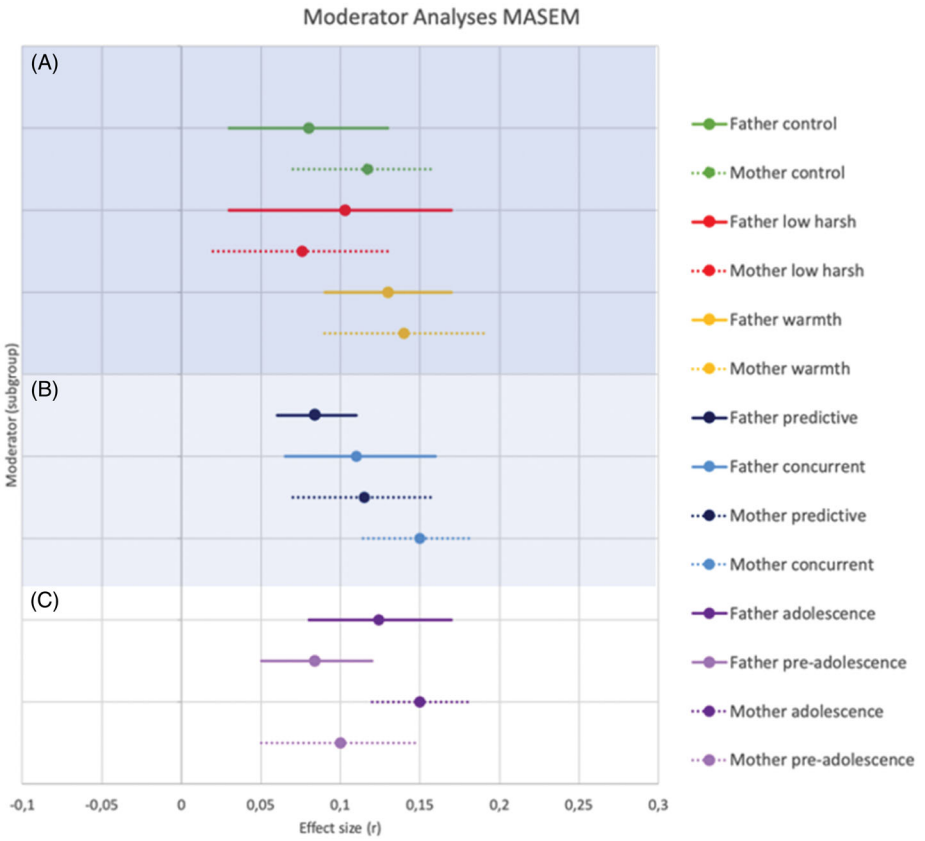

Figure 5. Overall effect sizes in our sample for the three moderation analyses we performed. A, B, and C represent three separate moderation analyses with A = parenting dimension (parental warmth, positive control, and low harsh parenting), B = study design (concurrent versus predictive), and C = average age of children in sample (pre-adolescence versus adolescence).

.12, $p < .001$, $r_{mother} = .15$, $p < .001$), see Figure 5. Pooled partial associations were similar for fathers and mothers for concurrent studies ($\Delta r = .03$, $p = .259$), predictive studies ($\Delta r = .03$, $p = .206$), pre-adolescence samples ($\Delta r = .02$, $p = .448$), and adolescence samples ($\Delta r = .03$, $p = .275$). Post-hoc test revealed that for fathers as well as mothers, there were no significant differences between the pooled partial associations of concurrent and predictive samples, and no differences in pooled partial associations between the pre-adolescence and adolescence samples, see Table 5. However, readers should note that we cannot rule out the possibility that the absence of significant differences between subgroups indicates a lack of power instead, given the small number of studies included in our meta-analysis.

Table 5. Differences in estimated pooled partial associations (Pearson's R) for different subsamples within each moderator for fathers and mothers.

Moderator	*r* (*SE*)	95% CI	*p*
Parenting Dimension			
ΔP Low Harsh – Warmth	–.02 (.04)	[–.10, .06]	.623
ΔM Low Harsh – Warmth	–.06 (.04)	[–.14, .01]	.088
ΔP Control – Warmth	–.05 (.03)	[–.11, .01]	.106
ΔM Control – Warmth	–.03 (.03)	[–.09, .04]	.367
ΔP Control– Low Harsh	–.02 (.04)	[–.11, .06]	.641
ΔM Control – Low Harsh	.04 (.04)	[–.04, .11]	.276
Study Design			
ΔP Concurrent – Predictive	.03 (.02)	[–.02, .08]	.222
ΔM Concurrent – Predictive	.03 (.03)	[–.03, .09]	.323
Age Child			
ΔP Adolescence – Pre-Adolescence	.04 (.03)	[–.01, .10]	.163
ΔM Adolescence – Pre-Adolescence	.05 (.03)	[–.01, .11]	.079

Note. P: paternal; M: maternal; Δ: difference in effect sizes; *r*: Pearson's r correlation coefficient; 95% CI: 95% confidence intervals of Pearson's *r* coefficient; *p*: *p*-value.

Discussion

The current meta-analysis aimed to show the relative associations of paternal and maternal parenting behavior with children's prosocial behavior by using the innovative statistical method Meta-Analytic Structural Equation Modeling MASEM (Cheung, 2008, 2015; Jak, 2015). To our knowledge, the current meta-analysis is the first to (a) include empirical studies on children's prosocial behavior that examined both fathers' and mothers' parenting behavior within the same family, allowing us to examine and compare the overall strength of the relative associations between mothers' and fathers' parenting behavior and children's prosocial behavior; and (b) identify the theoretical and methodological variables that moderate these linkages. In line with the general expectation in the literature that parenting behavior is linked with children's prosocial behavior, results of the included studies show that higher quality of both paternal and maternal parenting behavior was related to higher levels of prosocial behavior in children. The pooled relative effect sizes of paternal and maternal parenting behavior did not differ significantly, which implies that the relative associations of fathers' and mothers' parenting behavior with children's prosocial behavior are similar across studies. These relative associations were significant regardless of (a) study design (concurrent versus predictive) and (b) age composition of the sample (pre-adolescence versus adolescence).

Importantly, the directions of the pooled relative effect sizes concerning the three specific parenting dimensions were all significant and in accordance with our hypotheses: across studies, higher levels of parental warmth (including sensitivity, acceptance, and support), higher levels of positive control (including behavioral control, low psychological control, and low inconsistent discipline), and lower levels of harsh parenting (including

recoded measures of hostility, corporal punishment, and rejection) were associated with higher levels of prosocial behavior in children.

Paternal and maternal associations with children's prosocial behavior

The results of this meta-analysis highlight that the relative importance of fathers' parenting behavior, over and above the importance of mothers' parenting behavior (and vice versa), is similar in relation to children's prosocial behavior. The main finding that fathers' and mothers' parenting behavior is independently and similarly related to the child's prosocial behavior is in line with previous research and (narrative) reviews (e.g., Fagan et al., 2014; McDowell & Parke, 2009; Putnick et al., 2015). They are, however, in contrast with the views of scholars who claim that fathers' parenting behavior may have features that are linked to children's outcomes in unique ways (e.g., Paquette, 2004). In our meta-analysis we investigated three parenting dimensions, namely warmth, positive control, and harsh parenting. Our findings do not rule out the possibility that other parenting behaviors might have distinctive associations with children's outcomes for fathers and mothers. For example, it has been suggested that the effects of challenging parenting behavior (a relatively new parenting construct) on children's developmental outcomes differ between fathers and mothers (Majdandžić et al., 2014, 2016). We were unable to incorporate challenging parenting behavior in our meta-analysis, given that empirical studies linking mothers' and fathers' challenging behavior to children's prosocial behavior have not yet been published. Incorporating a wider range of parenting behaviors to validate whether mothers' and fathers' parenting behavior are similarly associated to children's prosocial behavior would be an interesting area for future empirical research.

The meta-analytically derived effect sizes of parenting behavior in general, and of parental warmth, low harshness, and positive control, on children's prosocial behavior were relatively small in the current study. The relatively small pooled effect sizes of fathers' and mothers' parenting behavior can be explained, in part, by the fact that these coefficients are controlled for the studies' effect sizes of mothers' versus fathers' parenting behavior respectively. This is also supported by the differences in magnitude of the random effects (i.e., zero-order pooled correlations presented in Table 2) compared to the relative effect sizes (i.e., pooled partial relative associations presented in Tables 3 and 4) of maternal and paternal parenting behavior with children's prosocial behavior in the current study. The partial coefficients represent the relative (and thus smaller) associations of fathers' and mothers' parenting with children's prosocial behavior across studies, and should therefore not be interpreted as the total association of

parenting behavior with children's prosocial behavior. A second explanation for the relatively small effect sizes is that we assessed associations between two multidimensional constructs: (1) with respect to parenting behavior, we were only able to focus on parental warmth, harshness, and positive parental control; and (2) with respect to prosocial behavior, we were only able to focus on helping, cooperating, sharing, and comforting behavior. As such, it is likely that a more encompassing measurement of parenting behavior would yield a larger effect size than the independently, relatively small effect sizes derived from our meta-analyses (see for a similar argumentation the meta-analysis by Teubert & Pinquart, 2010). Finally, it is important to note that comparable effect sizes are commonly found in social sciences and the interpretation of effect sizes can differ between disciplines (McCartney & Rosenthal, 2000), or even between subdisciplines. For example, social and developmental psychology generate strikingly smaller effects compared to experimental and biological psychology (Schäfer & Schwarz, 2019). Nonetheless, a small effect size does not have to imply that little can be gained with regard to prevention or interventions directed at increasing prosocial behavior in children. Interventions based on small effect sizes can still have major meaningful individual and societal benefits (Rose, 1981).

Sample age and study design

With regard to study design, and in contrast to our expectations, we did not find that the relative effect sizes of parenting behavior on children's prosocial behavior were significantly stronger for concurrent studies compared to predictive studies. It would be interesting to examine whether relative associations remain stable over time after controlling for the level of prosocial behavior at the first measurement moment using random intercept cross-lagged study designs in forthcoming meta-analyses. In addition, and again in contrast with our hypothesis, we did not find differences in pooled relative effect sizes for the pre-adolescence and adolescence samples within our meta-analysis. Our results seem to indicate that fathers' and mothers' parenting behavior is similarly associated with children's prosocial behavior in adolescence as at a younger age. This is notable, considering that it has been suggested that parental influence declines when children reach adolescence as peers become more important (Smetana et al., 2006). However, it should be noted that because of the relatively small number of studies, the findings of our moderator analyses should be interpreted with caution. We would like to stress that the lack of power in the current meta-analysis limits the generalizability of our findings, in particular those pertaining to our moderator analyses. Moreover, the absence of significant

differences between effect sizes could imply that differences between effect sizes are small, but it could also indicate a lack of power to be able to detect significant differences between effects (Borenstein et al., 2010). The current meta-analysis serves as an important first step in synthesizing existing research on mothers' and fathers' parenting behavior in relation to children's prosocial behavior. We encourage future research to replicate the current meta-analysis when more studies have been conducted on this topic, as this would provide (more) adequate power to be able to perform the moderator analyses conducted in the current study.

Limitations and future directions

Some limitations of our study should be mentioned here. First, while we were able to differentiate between different dimensions of parenting in our study, the relatively small number of studies included in our meta-analysis prevented us from also differentiating between different dimensions of prosocial behavior, such as helping, cooperating, comforting sharing, empathic and sympathetic behavior. Future research should carefully consider which domains of parenting are linked to different types of prosocial behavior and how this might change with the developmental phase of the child. A study design in which both parenting and prosocial behavior can be analyzed as multidimensional constructs might reveal more specifically how mothers' and fathers' parenting is associated with specific types of prosocial behavior (Padilla-Walker, 2014). Additionally, for future research it would be interesting to examine different operationalizations of our modeling mechanisms, for example to investigate whether parents' own prosocial behavior is related to that of their offspring (Craig et al., 2020).

Second, we were unable to examine the moderation effects of sex composition on the association between parenting behavior and children's prosocial behavior because the boy/girl ratio in most samples was evenly distributed. With only small variations across studies (ranging from 45% to 53% male), we would not be able to obtain meaningful results for such moderation analyses. We therefore would like to encourage future research to report on correlation coefficients separately for boys and girls, which enables forthcoming quantitative syntheses to assess possible moderator effects of child's sex more precisely.

Third, it is not possible to draw conclusions about the direction of the relative associations derived from our meta-analysis. Although, generally, associations between parent and child behaviors are viewed as parents influencing children's development, it has been suggested that children also affect parents, rather than the other way around (Bell, 1977/2020). The transactional view of family relationships describes families as dynamic

systems in which parenting and child behavior are reciprocally affected (Kerr et al., 2012). Indeed, empirical evidence showed that children's prosocial behavior also influences parenting behavior (e.g., Newton et al., 2014; Padilla-Walker et al., 2012) and that prosocial children create more opportunities for their parents to notice and reinforce prosocial behavior (Hastings, Utendale, et al., 2007). However, with the information currently available (predominantly cross-sectional or longitudinal study designs), we were unable to determine which part of the associations could be explained by parent effects, and which part by child effects. Thus, future researchers are encouraged to use experimental designs allowing them to make causal inferences concerning within-person change. If an experimental study design is not an option (e.g., for ethical reasons), longitudinal study designs that control for stable between-family differences (e.g., random intercept cross-lagged panel study designs) offer an alternative (Hamaker et al., 2015; e.g., see Van Lissa et al., 2019).

Fourth, because of the relatively small sample size, we were unable to include a nuanced moderator for the use of different measurement methods within our analyses. Given the small sample size, we could only create a dummy (e.g., same versus different source) which, from a theoretical point of view, would not yield any informative insights as the optimal source varies strongly per specific behavior (e.g., observations for parental sensitivity; questionnaires for harsh parenting). As such, we refrained from including such a moderator. We encourage future research to examine possible moderator effects of measurement methods on the association between parenting behavior and children's prosocial behavior.

Finally, as the current meta-analysis examining differences in relative associations of fathers' and mothers' parenting with child outcomes was constrained to intact heterosexual families, our results are not generalizable to other family constellations such as divorced, single-parent or same-sex families. We highly recommend future research to also investigate associations between parenting behavior and children's prosocial behavior in families other than traditional two-parent heterosexual families. For generalization purposes, but also for a more accurate representation of our contemporary society, more research is needed on associations between parenting and children's development within a broader definition of families.

Implications of our findings

The insights derived from our meta-analysis are relevant for future (preventive) parenting interventions. The vast majority of studies that focused on interventions targeted at children's prosocial behavior has included

solely mothers (e.g., Davis & Carlo, 2018; Liew et al., 2018; Menting et al., 2013; Westwood et al., 2019). Meta-analytic results have demonstrated that effects of existing preventive parenting interventions aimed at children's pro-social behavior are relatively small (e.g., Menting, Orobio de Castro, & Matthys, 2013). In line with recent calls for increased father participation in parenting interventions (Fabiano & Caserta, 2018; Frank et al., 2015; Panter-Brick et al., 2014), our findings suggest that the effectiveness of parenting interventions might improve when both mothers and fathers are included in intervention programs. Nonetheless, as the current meta-analysis is not able to make any inferences about causal linkages between parenting behavior and children's prosocial behavior, an important next step for researchers would be to use experimental research designs. This type of research allows to draw firm conclusions about the direction of causality.

Conclusion

Using state-of-the-art Meta-Analysis Structural Equation Modeling (MASEM) techniques, the current meta-analysis revealed that parenting behavior is significantly positively associated with children's prosocial behavior. In addition, our meta-analysis revealed that the pooled relative effect sizes of mothers' and fathers' parenting behavior on children's pro-social behavior were similar in strength, across all three parenting dimensions (warmth, harshness, and positive control) investigated. Our results suggest that future research and parenting interventions could benefit from taking a perspective that includes both mothers' and fathers' parenting behavior.

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No potential conflict of interest was reported by the authors.

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ORCID

Lisa van der Storm http://orcid.org/0000-0001-6462-1752
Caspar J. van Lissa http://orcid.org/0000-0002-0808-5024
Nicole Lucassen http://orcid.org/0000-0002-3432-0382

Katrien O. W. Helmerhorst http://orcid.org/0000-0002-3031-5017
Renske Keizer http://orcid.org/0000-0003-4051-1406

Data availability statement

The data and analyses that support the findings of this study are made openly available in the Open Science Framework (OSF) at http://doi.org/10.17605/OSF.IO/MHX8E.

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