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Maternal Depression and Parenting Self-Efficacy:

A Meta-Analytic Review

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Maternal Depression and Parenting Self-Efficacy:

A Meta-Analytic Review

By

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B.A., Vanderbilt University, 2012

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An abstract of a thesis submitted to the Faculty of the
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Abstract

Maternal Depression and Parenting Self-Efficacy: A Meta-Analytic Review
By Hannah F.M. Simon

Better understanding of the strength of the association between depression in mothers and their parenting self-efficacy beliefs has the potential to inform theory of how depression in mothers might be related to maladaptive parenting and to evaluate support for PSE as a potential target of preventative intervention for women with depression. This is important because both depression in mothers and the maladaptive parenting that characterizes many women with depression are associated with adverse outcomes in children. This meta-analytic review analyzed the results of the 26 studies that met the inclusion criteria, to address four goals: (1) to assess the magnitude of the relationship between maternal depression and parenting self-efficacy, (2) to test the support for several theory- and method-based potential moderating factors, (3) to integrate the two different literatures that have examined maternal depression and parenting self-efficacy (psychology and nursing) by examining their unique and overlapping features and testing discipline as a further potential moderator, and (4) to provide a roadmap for future research. Using a random effects model, the overall results indicated a medium effect size for the relation between maternal depression and parenting self-efficacy, r = -.34, 95% CI = -.40, -.26, p <. 001. Overall, there was significant and substantial heterogeneity among the effect sizes, $Q(36)$ = 753.31, p <. 001, I^2 = 95.22%. Follow up analyses revealed two significant moderators: depression measure and parenting experience. Shortcomings of the literature pointed to the need for research to: (1) examine the directionality of the relationship between parenting self-efficacy and maternal depression with longitudinal and experimental designs, (2) address the limited knowledge of the stability of parenting self-efficacy, and (3) extend findings beyond the primary focus on infancy and early childhood to mothers of school-aged children and adolescents.

Keywords: maternal depression, parenting self-efficacy

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Maternal Depression and Parenting Self Efficacy: A Meta-Analytic Review

Maternal Depression

Depression is one of the most common psychological disorders, affecting more than 16 million people worldwide and prevalence rates for woman are one and-a-half to three times higher than for men (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993). Between 6% and 17% of women experience a major depressive episode (MDE) at some point in their lives, with the highest rates of depression being in woman of childbearing age (Kessler et al., 1993). Of particular concern is depression during pregnancy and the postpartum, which characterizes 10-15% of women (O'Hara, Zekoski, Philipps, & Wright, 1990) and during the years of raising young children, when more than 17% of mothers show elevated depressive symptoms (Lyons-Ruth, Wolfe, Lyubchik, & Steingard, 2002; McLennan, Kotelchuck, & Cho, 2001). As such, maternal depression is a common and major public health problem affecting a significant portion of the population.

Maternal depression has serious consequences for children, including an increased risk for the development of psychopathology, both internalizing and externalizing, as well as wide-ranging problems in affective, cognitive, interpersonal, neuroendocrine, and brain functioning (Goodman et al., 2011). More specifically, children and adolescents of depressed mothers have rates of depression ranging from 20 to 41% (Goodman, 2007). And when children of depressed mothers become depressed, they have been found to have an earlier age of onset, longer duration; and it is associated with greater functional impairment and a higher likelihood of recurrence (Hammen, Burge, Burney, & Adrian, 1990; Kessler et al., 1993; Warner, Weissman, Fendrich, Wickramaratne, & Moreau, 1992).

Although depression in mothers may be associated with these problems in children through several mechanisms (Goodman & Gotlib, 1999), much of the research on mechanisms or

mediators has focused on the role of parenting by women with depression. Meta-analytic reviews of the studies of maternal depression and parenting behavior have focused on three categories of parenting: negative/hostile exchanges, disengagement, and positive social interactions. Lovejoy et al. (2000) found that depressed mothers exhibited significantly higher levels of negative and disengaged behavior and showed significantly lower levels of positive behavior than non-depressed mothers. Although the effects were small (r = .20, .14, and .08, respectively) according to Cohen's (1992) conventional values for effect size, Lovejoy et al., (2000) identified multiple moderators of this relationship, including some that revealed medium effect sizes for associations between depression in mothers and parenting. That is, depression in mothers was more strongly associated with negative parenting among currently depressed mothers, relative to those with depression in the past, and the association between depression in mothers and (less) positive parenting was stronger among mothers with economic disadvantage and younger children, and in studies with shorter observations and observations in unstructured laboratory settings. Given these demonstrated parenting difficulties in depressed mothers, further examination is needed of the specific ways in which depression may affect parenting behavior.

Self-Efficacy

One pathway that has been proposed for how depression in mothers might be associated with their maladaptive parenting is by way of their lower self-efficacy beliefs. Self-efficacy is defined as an individual's belief in his or her ability to successfully perform a given task (Kohlhoff & Barnett, 2013). Self-efficacy is especially important in the context of depression, given well-established links between depression and cognitive distortions, dysfunctional beliefs, and information-processing biases (Beck, 2008). Individuals' beliefs in their efficacy to regulate their own functions and to exercise control over events that affect their lives is the most central

and pervasive mechanism of human agency (Bandura, 1997), and is considered a key determinant of resilience (Masten & Cicchetti, 2016). Without these beliefs, one has little incentive to act or persevere in the face of difficulties. Bandura posits that low self-efficacy contributes to the development of depression in three ways: (1) inefficacy to fulfill one's valued standards: unfulfilled aspirations gives rise to self-devaluation; (2) low sense of social efficacy; failing to develop social relationships that bring satisfaction to people's lives and enable them to manage chronic stressors; and (3) low sense of control over depressotypic thoughts; engaging in recurrent rumination about dejecting life events and one's despondent state amplifies and prolongs depressive reactions (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999). In each of these ways, self-efficacy beliefs may play a critical role in the development and maintenance of depression and have the potential to enhance understanding of depression and adverse parenting in mothers.

Parenting Self- Efficacy

The concept of self-efficacy has been extended to many domains, including parenting. Parenting self-efficacy is defined as the beliefs a parent holds about his or her capabilities to organize and execute the tasks related to parenting a child, and has been called the "final common pathway" in the determination of effective parenting (Teti & Gelfand, 1991). Parenting self-efficacy has been studied using a variety of terms, including competence, confidence, efficacy, perceived role attainment, and self-esteem (Salonen et al., 2009). Regardless of this range of terms, the parenting self-efficacy construct refers to the degree to which parents feels competent and confident in their capacity to parent.

Although parenting self-efficacy has been widely studied, research is characterized by at least three approaches to conceptualize and measure it. Parenting self-efficacy has been

examined as both global and domain-specific, which may represent two distinct conceptual constructs. Whereas global parenting self-efficacy refers to one's overall general sense of capabilities and power as a parent, domain-specific conceptions of parenting self-efficacy refers to one's ability to organize and execute parenting actions that produce desired results (Leahy-Warren, McCarthy, & Corcoran, 2011). Salonen et al. (2009) present a more comprehensive definition of parenting self-efficacy, which incorporates both general and domain-specific components, in which parenting self-efficacy includes: (1) parents' personal beliefs about parenting, (2) what a parent can do under a set of conditions with their capabilities, (3) a set of organized actions to produce a set of tasks under difficult circumstances and (4) situation-specific tasks.

As suggested by the concept of parenting self-efficacy as the "final common pathway" to effective parenting (Teti & Gelfand, 1991), parents' sense of self-efficacy has been found to be associated with parenting quality, with a broad array of parenting behaviors, and with parenting competence (Coleman & Karraker, 2000; Jones & Prinz, 2005). These associations are interpreted as reflecting the idea that parents with high parenting self-efficacy may have more confidence in acquiring and exercising effective parenting skills. In contrast, parents with low parenting self-efficacy, who believe that they do not have the ability to parent successfully, may give up more easily in the face of the many common challenges that face parents, may not put their knowledge of parenting into action, may become preoccupied with themselves, or may become emotionally aroused in ways that interfere with effective parenting (Jones & Prinz, 2005). Consistent with this understanding, parents' low levels of parenting self-efficacy have been found to be related to their poor persistence and follow-through in parenting tasks (Johnston

& Mash, 1989). Overall, low parenting self-efficacy is associated with a number of maladaptive parenting behaviors.

In addition to links between parenting self-efficacy and maladaptive parenting, parenting self-efficacy is also closely linked to child adjustment and other developmental outcomes (Teti & Gelfand, 1991). In their meta-analytic review of associations between parenting self-efficacy and child adjustment, Jones and Prinz (2005) found moderate effect sizes for associations between parenting self-efficacy and independent reports of child behaviors, including emotional and behavioral problems (e.g. anxiety), socio-emotional functioning, and child academic achievement, across child ages and sample characteristics. For example, Coleman and Karraker (2003) found a significant relationship between parenting self-efficacy and toddler adjustment, with higher maternal parenting self-efficacy predicting higher child enthusiasm, compliance, affection, and lower child avoidance and negativity. In terms of the association between parenting self-efficacy and school performance, at least two studies have found that parenting self-efficacy may act indirectly on academic performance through parental involvement and monitoring (Hoover-Dempsey, Bassler, & Brissie, 1992; Shumow & Lomax, 2002). Given this support for the relationship between parenting self-efficacy and child outcomes, the importance of parenting self-efficacy cannot be overlooked (Jones & Prinz, 2005).

Parenting Self-Efficacy and Depression in Mothers

In light of well-established links between both maternal depression parenting self-efficacy and maladaptive parenting, as well as between depression and parenting self-efficacy with adverse child outcomes, this review aims to examine the strength of the association between maternal depression and parenting self-efficacy. A better understanding of this relationship has the potential to contribute to the understanding of parenting self-efficacy as a correlate of

depression that is also associated with maladaptive parenting and with negative consequences for children.

Better understanding of this association also has potential public health significance. If a strong association is found between mothers' depression and their parenting self-efficacy, this finding would provide support for identifying women with low parenting self-efficacy for participation in preventative intervention studies, such as parenting interventions (Goodman & Garber, 2017). Given issues with stigma related to depression and treatment of mental disorders, women with depression may be more open to interventions when they are identified by their parenting self-efficacy relative to interventions whereby they are identified based on their depression. Enhancing parenting self-efficacy may also be accomplished with fewer sessions and less cost, and an effective intervention to enhance parenting self-efficacy may be more easily disseminated relative to evidence-based treatments for depression.

Two studies provide support for either direct or indirect benefits of enhancing parenting self-efficacy, albeit not from studies of depression in mothers. In terms of direct benefits, in their study of a family support early intervention for high-risk families of 2-5 year olds (which targeted parenting self-efficacy along with parenting skills), Miller-Heyl et al (1998) identified parenting self-efficacy as a key mechanism of change; for participants in the intervention, increase in their parenting self-efficacy helped to explain the significant increases in parental self-appraisals and democratic child-rearing practices, and corresponding decreases in harsh discipline. Further, Miller-Heyl et al. (1998) found that participants in the intervention showed a significant increase in parenting self-efficacy compared to those in the control condition, and higher parenting self-efficacy was linked with use of positive parenting practices, positive limit-setting, and less use of physical punishment. In addition, in their study of the long term efficacy

of a behavioral parent training intervention, Tucker, Gross, Fogg, Delaney, and Lapporte (1998) found that maternal parenting self-efficacy increased significantly as a result of the intervention, with a 31 point mean increase in parenting self-efficacy, compared with a 15 point decrease for mothers who did not receive the intervention. In terms of indirect benefits, higher parenting self-efficacy of fathers, but not mothers, predicted children's subsequent more positive treatment response in a study of treatment for ADHD (Hoza et al., 2000).

Overall, this set of findings suggests that parenting self-efficacy may be a particularly fruitful target of intervention for depressed mothers. Additional support for such initiatives would come from knowledge of the extent to which mothers' depression is associated with their parenting self-efficacy. Further, knowledge from moderator analyses regarding whether the association is stronger for some individuals than others has implications for whom to prioritize for such interventions. Better understanding of the groups for whom parenting self-efficacy may be an especially important target of intervention would allow us to identify those who may benefit the most.

Potential Moderating Factors

In addition to the primary goal of estimating the strength of the association between mothers' depression and their parenting self-efficacy, understanding of moderators of that association has the potential to reveal the characteristics or qualities associated with the depression-parenting self-efficacy link being stronger or weaker. Thus, examining moderators was a secondary goal. The literature on parenting self-efficacy among depressed mothers is diverse in terms of sampling strategies, demographics of the samples, and measures, each of which may be associated with variability in the overall strength of the relationship. Theoretical-

and empirical bases for examining both conceptual and methodological potential moderators are discussed below.

Conceptual. First we discuss several proposed conceptual moderators.

Timing and severity of depression. Two potential moderators of the association between depression and parenting self-efficacy in mothers are related to characteristics of the mothers' depression: timing of depression (i.e., the depression being current – concurrent with the parenting self-efficacy measure – relative to depression indexed as having occurred in the past) and severity of depression (i.e., mild, moderate, severe). Although expecting an association between current depression and parenting self-efficacy can be easily justified based on knowledge of cognitive aspects of depression, there are also strong bases for expecting parenting self-efficacy to be associated with past depression. Because individuals who remit from depression often have mood disturbances, cognitive vulnerabilities, and functional impairment that persist after the acute symptoms, parenting deficits may continue after depression has remitted (Forman et al., 2007). Further, Billings and Moos (1986) found that children of formerly depressed mothers continue to experience significant adjustment difficulties even after their mothers' depressive symptoms subside. Taken together, it is expected that depression and parenting self-efficacy will be significantly associated among samples of mothers with current depression as well as among samples of mothers whose depression was in the past.

In terms of severity, in addition to expecting an overall significant association between depression and parenting self-efficacy, we examined the potential role of severity. That is, we considered whether the strength of the association between depression and parenting self-efficacy may be limited to those with high depression severity, or whether the association also extends to those with moderate or low levels of depression severity.

Maternal age. Maternal age has been found to be associated with both parenting self-efficacy and depression and thus may be a moderator of the strength of association between parenting self-efficacy and depression. Froman and Owen (1990) found maternal age as among the strongest (r = .28) correlates of parenting self-efficacy among mothers ranging from ages 15-43, such that younger mothers have lower parenting self-efficacy. Kessler et al. (1994) found that cumulative rates of depression among women increased with age for each cohort studied. Although not providing a strong basis for a hypothesis, taken together, these findings suggest that younger maternal age may moderate the relationship between maternal depression and parenting self-efficacy. It is expected that the association will be stronger in studies in which mothers are younger, on average.

Child age. The role of the parent changes over the child's life, with some evidence that parenting is at its most intense and the demands of parenting are often greatest during infancy and early childhood (Bornstein, 1995). No studies of which we are aware have examined parenting self-efficacy as a direct correlate with child age. In addition, the prevalence rate for major depression during the postpartum period is high, with a mean of about 14%, relative to 10% of women 18 to 44 years old (Wisner et al., 2013). Taken together, it is expected that the association between depression and parenting self-efficacy will be stronger in studies with samples of younger child age, on average.

Parenting experience. Although studies are unlikely to have quantified how much experience mothers may have had with children (their own younger siblings, providing child care to other children, etc.), the more opportunity a mother has to engage in, and master, parenting tasks, the more likely she is to believe she has the ability to parent effectively, as self-efficacy beliefs are influenced by perceived mastery. Consistent with this idea, Froman and Owen (1990)

found that number of children was among the strongest correlates (.35, $p<.001$) of maternal parenting self-efficacy, such that having more children was associated with higher parenting self-efficacy. This finding supports the idea that mothers who have experience caring for children have stronger efficacy than those who are new to the parenting role. However, it is not clear to what extent experience in parenting may moderate the association between depression and women's sense of efficacy. That is, might depression be more strongly associated with parenting self-efficacy among women parenting their first child relative to those parenting their second or later child? Thus, we tested the extent to which the relationship between maternal depression and parenting self-efficacy might be stronger in first time mothers, whose sense of parenting self-efficacy has not yet been bolstered by experience, and therefore their depression may be more strongly associated with their parenting self-efficacy, relative to mothers parenting their second or later child.

Socioeconomic status. Among studies of general self-efficacy, living in lower socio-economic status (SES) neighborhoods has been found to be associated with lower self-efficacy (Boardman & Robert, 2000). At the same time, higher parenting self-efficacy, specifically, has been found to buffer against the more negative consequences of disadvantage (Crosnoe, Mistry, & Elder, 2002), such that parenting self-efficacy moderated the relationship between economic disadvantage and adolescent's educational changes. In addition, rates of major depressive disorder (MDD) are higher for those living in poverty, with almost 50% of low income mothers of infants and young children having depression (Knitzer, Theberge, & Johnson, 2008). On the bases of these findings, we tested the extent to which economic disadvantage may moderate the relationship between maternal depression and parenting self-efficacy, such that the association would be stronger for women who live in disadvantaged conditions.

Methodological. Next we discuss a set of proposed methodological moderators.

Method of assessing depressive symptoms. The association between maternal depression and parenting self-efficacy may also be moderated by the way in which depression is defined, i.e., with a clinical diagnosis from a diagnostic interview compared to elevated scores on self-report measures. It has been argued that elevated scores on depression symptom scale measures, relative to diagnostic interviews reflect general distress rather than depression per se (Boyd, Weissman, Thompson, & Myers, 1982), and this may be even more true for some of the depression symptoms scales, such as the Center for Epidemiologic Studies Depression Scale (CES_D; Radloff (1977). Thus, we examined the extent to which the association between maternal depression and parenting self-efficacy is specific to depression that meets diagnostic criteria for a major depressive episode or if the association generalizes to an elevated depression symptom level. We expected that studies that sampled women who met diagnostic criteria for a depression disorder would yield higher correlations between depression and parenting self-efficacy compared to studies that designated depression as an elevated score on a depression symptom scale. In addition, as suggested, there exists variation among different self-report measures of depression. Self-report measures of depression have been designed to assess depressive symptoms in different populations, such that the CES_D (Radloff, 1977) was developed as a measure of depressive severity for adults in the community, whereas the BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was developed for individuals already diagnosed with depression. Moreover, the BDI-II was designed to closely mimic diagnostic criteria, including the two week duration of symptoms. The CES_D has been found to be less specific and to emphasize more affective components of depression, compared to the BDI, which assess the cognitive component of depression (Santor, Zuroff, Ramsay, Cervantes, & Palacios,

1995). Principal component factor analysis of another commonly used scale, the Edinburgh Postnatal Depression Scale (Cox, Holden, & Sagovsky, 1987) has found that only four of the ten items load on depression, while three load on anxiety (Ross, Evans, Sellers, & Romach, 2003). Given the theoretical importance of cognitive elements of depression in terms of its impact of parenting self-efficacy and that the BDI maps closely onto symptoms of depression, we expected that the relationship between parenting self-efficacy would be stronger in studies that used the BDI than in studies that used other self-report measures of depression.

Method of assessing parenting self-efficacy. The association between parenting self-efficacy and maternal depression may be moderated by the way in which parenting self-efficacy is measured. Although parenting self-efficacy has been measured exclusively by self-report, three types of scales assess different aspects of parenting self-efficacy, paralleling variation in definitions of the construct of parenting self-efficacy, as mentioned earlier in this paper: (1) domain-general parenting self-efficacy, defined as the extent to which a parent feels competent in the parenting role, with no focus on specific parenting tasks; (2) task-specific parenting self-efficacy, defined as similar to general parenting self-efficacy, but items are task-specific and yield a summary of parenting self-efficacy across tasks; and (3) domain-specific parenting self-efficacy, which is focused on one parenting domain such as discipline (Jones & Prinz, 2005). We treated type of parenting self-efficacy measure as a moderator of the association between depression and parenting self-efficacy in mothers in an exploratory manner, with no specific hypotheses.

***Quality of measures*.** The quality of measures is an important consideration in meta-analytic reviews. Overall, meta-analytic reviews find decreasing effect sizes as research standards in general and criteria for psychometric properties of measures, in particular, have

become more stringent (Hetrick et al., 2015). Therefore, it is expected that the relationship between maternal depression and parenting self-efficacy will be stronger in studies in which the measures were of lower quality, consistent with this trend.

Date of Publication. Consistent with findings of decreasing effect sizes as standards improve, it is expected that the relationship between maternal depression and parenting self-efficacy will be stronger in studies published earlier.

Integration of Two Distinct Literatures

In addition to testing the overall association between depression and parenting self-efficacy in mothers and testing potential moderators of that association, a third aim of the review was to integrate the literatures across two distinct disciplines that have examined associations between maternal depression and parenting self-efficacy, psychology and nursing. Psychology has approached the topic from the broad perspective of examining parenting self-efficacy in relation to a wide variety of parent characteristics, including attachment, self-criticism, social support, and past history or abuse, and the effects of these characteristics on both parenting beliefs and behaviors. In contrast, nursing has approached the topic largely in terms of child characteristics and the development of infant care skills; this can be seen in the proportion of nursing studies examining parenting self-efficacy among pregnant women and mothers of infants. This difference may be attributed to the fact that nurses are often on the front lines of administering care to mothers after they have given birth, and are tasked with assisting mothers in specific child-care practices.

Although there is some methodological overlap between studies of parenting self-efficacy and depression in nursing and psychology, this review aimed to integrate findings from each discipline in order to consolidate all published findings of the relationship between parenting

self-efficacy and maternal depression. As one step in that integration, we proposed to examine discipline as a potential moderator of the association between parenting self-efficacy and depression in an exploratory manner, given that the literature is unclear on whether the association found by studies from one discipline might be stronger than those found by the other discipline.

Future Research

A fourth and final aim of this review was to provide a roadmap for future research. We expected that knowledge of the overall effect size of the relationship between maternal depression and parenting self-efficacy, along with findings from tests of potential moderating factors, and examination of the potential role of the discipline of the researchers would reveal limitations in being able to draw conclusions from the available body of literature. To the extent that such limitations are revealed, we planned to propose directions for future research on the relationship between parenting self-efficacy and maternal depression.

Summary of Hypotheses and Aims

Main effects. It was hypothesized that maternal depression would be significantly negatively associated with parenting self-efficacy beliefs.

Potential Moderator Effects. It was expected that the association between maternal depression and parenting self-efficacy would be moderated by the timing and severity of maternal depression, the method of assessing depressive symptoms, parenting experience, and economic disadvantage. Specifically, it was predicted that the association between maternal depression and parenting self-efficacy would be stronger in studies of currently depressed women than in studies of women with a history of depression and in studies in which depression is more severe and meets diagnostic criteria for major depressive episode rather than an elevated

score on a depression symptom scale. It was also predicted that certain participant characteristics will serve as exacerbating features such that the association will be stronger in studies of less experienced mothers, younger mothers, mothers of younger children, and mothers with economic disadvantage. Finally, we explored the potential moderating role of the measure of parenting self-efficacy being general or task-specific, with no explicit hypothesis.

Overall, the aims of this review were: (1) to assess the magnitude of the relationship between maternal depression and parenting self-efficacy, (2) to identify potential moderating factors, (3) to integrate the literatures examining maternal depression and parenting self-efficacy across two disciplines, and (4) to provide a roadmap for future research.

Method

Selection of Studies

A literature search was undertaken for all published studies that included measures of depression and parenting self-efficacy in mothers and reported their association. A computer search of Google Scholar and PsychINFO was conducted using combinations of key words: maternal depression, depression, parenting self-efficacy, parenting, maternal self-efficacy, and parent competence. In addition, reference lists from empirical studies and review articles (Jones & Prinz, 2005) were perused for other relevant investigations, and papers citing these relevant studies were screened in Google Scholar. We placed no restrictions on publication date and finalized the search in January 2017.

This search resulted in 27 studies that examined the relationship between maternal depression and parenting self-efficacy, whether or not this association was the central focus of the paper.

Criteria for Inclusion/Exclusion of Studies

Three criteria were used to select studies for inclusion in the meta-analysis: (a) publication in a peer-reviewed journal, monograph, or edited book, (b) measurement of both depression and parenting self-efficacy in mothers and (c) provision of sufficient information to allow computation of effect sizes for the association between depression and parenting self-efficacy.

In terms of the first criterion, although the decision to use only peer-reviewed published studies may reflect a "file drawer" bias (Rosenthal, 1979), in which studies with significant findings are much more likely to be published than those with nonsignificant findings, the use of peer-review published studies provides some degree of quality control in the selection of studies. However, to control for this potential bias, "fail-safe N's" will be calculated to control for each of our categories using the procedures recommended by Rosenthal (1991) for use in meta-analyses. Fail-safe N's provide an estimate of the number of unpublished studies that would need to exist in order to bring overall effect sizes to a nonsignificant level (Rosenthal, 1991). Second, to be included in the meta-analysis, each study had to include mothers who were identified as depressed based on a diagnostic interview or mothers who were administered a depression symptom scale as well as having been administered a parenting self-efficacy scale. Excluded were studies of pregnant women and studies that measured a variant of parenting self-efficacy, such as maternal self-esteem (Fleming, Ruble, Flett, & Shaul, 1988), which was determined to be a different construct. Third, each study had to provide sufficient information to calculate the effect size. We used and display the recommended flow diagram for meta-analytic reviews (American Psychological Associaton, 2009) to indicate how many studies were screened and

excluded on each of these bases. This search yielded 37 studies, 10 of which were excluded (See Figure 1).

Coded Variables (see Appendix)

The first author coded the studies for the variables described below. A trained research assistant independently coded the same variables for a randomly selected 20% of the included studies and entered effect sizes for all of the included studies. Reliability was excellent for effect sizes (100%) and for other study variables (96%).

Study Characteristics. From each article, we abstracted descriptive information including the authors' names, the journal in which the study was published, and date of publication.

Timing and Severity of Depression. For each study, timing of depression (i.e., current or lifetime/past) and severity of depression were coded, or coded as missing if this information was not provided.

Maternal Age. For each study, maternal age was coded as the mean age of mothers included in the sample.

Child Age. Child age was coded as the mean age of children included in the sample. Age was converted to years (or portion of a year) to allow for comparison across studies.

Parenting Experience. Parenting experience was coded by the percentage of the sample that were primiparous (first-time mothers), or as missing if this information was not provided.

Socioeconomic Status. Nearly all studies provided information on participants' income, education level, or both. In order to obtain a continuous variable, we took as scores from each study either the percentage of the sample that was considered low income or the percentage of the sample that had a high school degree or less. For studies that reported both economic

disadvantage and education level, the percentage of the sample that was considered disadvantaged was used.

Field. Studies were coded as either nursing or psychology, depending on the author's affiliations and/or the journal in which the article was published.

Measure of Depression. For each study, the method of assessing depression was coded (i.e., diagnostic interview or self-report questionnaire). Among studies that used self-report measures, the specific measure that was administered was coded. See Table 4 for psychometric information for coded self-report measures.

Measure of Parenting Self-Efficacy. For each study, the measure used to assess parenting-self efficacy was coded as either: (1) domain-general, (2) task-specific, or (3) domain-specific using guideline put forth by Barnes (2007) and Črnčec, Barnett, and Matthey (2010). See Table 5 for psychometric information for coded parenting self-efficacy measures.

Quality of Measure. Measures were coded for quality using the MARS standards as outlined by APA guidelines (Publications, on Journal, & Standards, 2008). Quality was coded using internal consistency alpha levels for measures of depression and parenting self-efficacy.

Analyses

Computation of Effect Size. Studies varied in whether they expressed the parenting self-efficacy-depression association in terms of Pearson's product-moment correlation (r; n = 25), mean difference between-groups (i.e. comparing parenting self-efficacy for women who scored higher versus low on a depression symptom scale; n = 1), or as an odds ratio (n = 1). Following Rosenthal (1994), the effect size r was used to express the association between maternal depression and parenting self-efficacy. Effect size values were calculated for the association of interest within each study using Comprehensive Meta-Analysis software and guidelines put forth

by Lipsey and Wilson (2001). For studies that included more than one time point or subgroup (n = 7), all effect sizes for the association between maternal depression and parenting self-efficacy were included.

The following statistics were calculated: (a) effect sizes for the relationship between maternal depression and parenting self-efficacy; (b) I^2 statistics (Higgins & Thompson, 2002) for each effect size, which describes the percentage of total variation across studies that is due to heterogeneity rather than chance (Higgins, Thompson, Deeks, & Altman, 2003), (c) Q-statistic, which evaluates the significance of the observed heterogeneity; and (d) tau-squared values, which are indices of between-study variance. A random effects model was used (Hedges & Vevea, 1998), as random effects models are based on the assumption of systematic differences and account for variation due to error among studies included in the analyses.

Moderator Analyses. For categorical moderations, subgroup analyses were conducted in which random effects models were used to combine studies within each-subgroups and then used to estimate the overall effect. Following the recommendation of Borenstein, Hedges, Higgins, and Rothstein (2009), each level of categorical moderators had to be present in three or more studies to be included in moderation analyses. For continuous moderators, meta-regression analyses were conducted to evaluate their impact on effect sizes.

Publication Bias. Publication bias was examined using various procedures. Funnel plots, which provide a graphical depiction of publication bias, were examined. Rosenthal's (1991) Fail-Safe N was calculated at the study-level, indicating the number of studies, if included, would nullify the observed effect (see Table 1). Additionally, Duval and Tweedie (2000) 'trim and fill' statistic, which provides an adjusted effect size estimate after correcting for publication bias, was calculated.

Results

Study Sample

In total, results from 38 effect sizes from 27 studies published from 1986-2017 met the inclusion criteria. Collectively, these studies included 8462 mothers. Sample sizes per study ranged from 49 to 822 mothers, with an overall mean of 248.2 mothers per study.

Tests for Heterogeneity

There was significant and substantial heterogeneity among the effect sizes, $Q(36) = 189.01$, $p <. 001$, $I^2 = 81.48\%$, indicating that 81.48% of the variance among effect sizes can be attributed to heterogeneity instead of chance. This finding supported the use of a random effects model. Examination of standardized residuals of the effect sizes revealed one outlier, whose standardized residuals were more than three standard deviations higher than the mean (4.53). Moderator analyses were conducted to examine to what extent this outlier influenced the aggregate effect size. The study identified as a potential outlier (Schuetze & Eiden, 2005) had a significantly higher effect size than the rest of the sample, Q=123.093, $p<.001$. This effect size was therefore dropped from subsequent analysis given its' adverse and undue effect on the overall effect size. This left 37 effect sizes from 26 studies.

Study-Level Analyses

Using a random effects model, the overall results indicated a medium relation between maternal depression and parenting self-efficacy, $r = -.34$, 95% CI = -.40, -.26, $p <. 001$. See Table 1.

Moderator Analyses for Conceptual Continuous Moderator Variables

A series of meta-regression analyses were conducted to examine whether the hypothesized moderators that were measured continuously - the mean ages of the mother and the

child, the percentage of the sample that were first time mothers, and SES - significantly moderated the relationship between maternal depression and parenting self-efficacy. Details are presented in Table 2, and overall findings are described next.

Maternal and child age. The mean age of mothers in these samples ranged from 17.3 to 36.5, with an overall mean of 27.93. The mean age of children in these samples ranged from birth to 10 years, with an overall mean of 1.65 years. Results failed to support the hypotheses regarding maternal and child ages, such that the relationship between maternal depression and parenting self-efficacy was not significantly moderated by either maternal age, Q = .00, p = .99, or child age Q = .00, p = .92.

Parenting experience. Consistent with our hypothesis, results indicated that parenting experience, as measured by the percentage of the sample that was primiparous, significantly moderated the relationship between maternal depression and parenting self-efficacy, Q = 4.99, p = .02, such that the relationship was stronger in studies where a higher percentage of the sample were first time mothers.

Socioeconomic status. Results failed to support the hypothesis that the relationship between maternal depression and parenting self-efficacy would be stronger for mothers of lower SES, Q = .22, p = .64.

Moderator Analysis for Conceptual Categorical Variables

Construct-level analyses tested for moderation of the association between mothers' depression and parenting self-efficacy for conceptual categorical moderators. Results of these analyses are shown in Table 3 and presented below.

Timing and Severity of Depression. We were unable to test the potential moderating roles of timing and severity of depression, due to the limited number of studies that provided this information.

Discipline. Overall, 11 (29.7%) effect sizes came from nursing studies and 26 (70.3%) from psychology. Results indicated that effect sizes were not significantly stronger in the studies by researchers in the field of psychology compared to nursing, Q = 0.21, p = .65.

Moderator Analyses for Methodological Continuous Variables

Meta-regression analyses were conducted to examine whether the hypothesized methodological moderators that were measured continuously significantly moderated the relationship between maternal depression and parenting self-efficacy. Details are presented in Table 2, and described next.

Quality of measures. Results failed to support the hypotheses that the quality of measures used to assess maternal depression and parenting self-efficacy would significantly moderate the relationship. Neither quality of depression measure, Q = 1.62, p = .20, nor quality of parenting self-efficacy measure, Q = .00, p = .95, significantly moderated the relationship.

Moderator Analyses for Methodological Categorical Variables.

Construct-level analyses tested for moderation of the association between mothers' depression and parenting self-efficacy for methodological categorical moderators. Results of these analyses, shown in Table 3, are presented below.

Measure of depression. Overall, 3 (7.6 %) effect sizes came from studies where mothers' depression was measured with clinical diagnostic interviews and 34 (92.4%) came from studies relying on mothers' completion of self-reported symptom scales. Results indicated the use of diagnostic versus self-report rating scales did not significantly moderate the relationship between

maternal depression and parenting self-efficacy, Q = .09, *p* = .76. However, results further indicated that, among self-report measures of depression, the specific instrument used to measure depression significantly moderated the relationship between maternal depression and parenting self-efficacy (Q = 26.81, *p* <.001). Of the 34 effect sizes that came from studies that used a self-report measure of depression, 14 (41.2%) used the CES-D, 9 (26.4%) used either the BDI I or II, 7 (20.5%) used the EPDS, and 3 (8.8%) used another self-report measure. One study used both the BDI and the EPDs, and so was excluded from this analysis. The relationship between parenting self-efficacy and maternal depression was strongest when depression was measured using the either the Beck Depression Inventory I or II, *r* = -.43, compared to studies that used the CES-D, *r* = -.25, EPDS, *r* = -.37, or another self-report measure, *r* = -.31. Planned comparisons revealed that the relationship between maternal depression and parenting self-efficacy was significantly stronger in studies using the BDI I or II than in studies that used the CES-D, Q = 23.89, *p* <.001.

Measure of parenting self-efficacy. Of the included effect sizes, 21 (56.7%) came from studies that measured parenting self-efficacy with a domain-general measure, 13(35.1%) from studies with a task-specific measure, and 3(8.1%) with a domain-specific measure. The way in which parenting self-efficacy was measured did not significantly moderate the association between parenting self-efficacy and maternal depression, Q = 3.18, *p* =. 20.

Discussion

This meta-analytic review assessed the magnitude of the relationship between maternal depression and parenting self-efficacy and the role of hypothesized moderators in order to advance our understanding of the overall strength of the relationship and how it might vary among distinct, theoretically relevant subgroups and by methodological qualities. Although 26

studies were found to have reported on this relationship since 1986, and all reported a negative association, the strength of this association has been found to vary across studies. The association between parenting self-efficacy and maternal depression has been studied in the contexts of a broad array of parent and child factors, including: adult attachment, parenting stress, parent sensitivity, social support, self-criticism, childhood maltreatment, infant temperament, and infant health (Caldwell, Shaver, Li, & Minzenberg, 2011; Farmer & Lee, 2011; Leahy-Warren et al., 2011; Michl, Handley, Rogosch, Cicchetti, & Toth, 2015; Porter & Hsu, 2003; Teti, O'Connell, & Reiner, 1996). This varied range of parent and child characteristics as contexts for the study of the association between depression and parenting self-efficacy support the sense of importance of the association. Yet researchers continue to investigate the degree of association between depression and parenting self-efficacy, suggesting a lack of consensus or confidence in knowledge of the extent to which they are associated. Thus, a primary aim of this review was to generate an estimate of the overall effect size. Additional aims were to examine the set of proposed moderators, to integrating two fields that have investigated this relationship, psychology and nursing, and to consider the implications of the findings for next steps in this line of research.

Study-level analyses confirmed that maternal depression is significantly, negatively associated with parenting self-efficacy, with a medium effect. Examination of parenting self-efficacy is especially important in the context of maternal depression, given that depression is associated with cognitive symptoms such as feelings of worthlessness and hopelessness, which may also impact a mother's sense of her ability to parent effectively. Although maternal depression and parenting self-efficacy have consistently been found to be significantly related, knowledge of this overall effect size provides important information about the strength of this

relationship. In addition, previous meta-analyses on the relationship between maternal depression and other parenting characteristics, such as disengaged or positive parenting, have found small effect sizes (Lovejoy et al., 2000). This study found an overall moderate effect size, suggesting that the relationship between maternal depression and parenting self-efficacy is stronger than the relationship between maternal depression and other aspects of parenting. While the strength of the overall relationship does not provide information on direction of the relationship, this finding suggests that parenting self-efficacy is consistently, significantly lower in relation to higher levels of depression in mothers, which has important implications for theory and practice with depressed mothers. In particular, the overall effect size supports parenting self-efficacy is likely to play an important role in models explaining associations between depression and parenting quality, given well-established links between parenting self-efficacy and parenting behavior (Coleman & Karraker, 2000) and between depression and parenting (Lovejoy et al., 2000).

There was significant and substantial heterogeneity among the effect sizes; conceptual and methodological moderator analyses were conducted in order to account for such heterogeneity. It was hypothesized that the association between maternal depression and parenting self-efficacy would be strong for both mothers currently suffering from depression and those with past histories of depression. Further, it was hypothesized that the association would be stronger for those with high depression severity. Although studies that used depression scales are, in a sense, testing severity of depression, studies failed to report what proportion of their samples exceeded established cut scores to indicate either moderate or severe depression. While theoretically relevant, we were unable to run moderation analyses to examine whether the relationship between maternal depression and parenting self-efficacy was stronger depending on

the timing and severity (mild, moderate, severe) of depression. Future studies should investigate the extent to which the relationship between maternal depression and parenting self-efficacy differs depending on timing and severity of depression.

Neither maternal nor child age significantly moderated the strength of the association between maternal depression and parenting self-efficacy. It was hypothesized that maternal and child age would moderate the association between maternal depression and parenting self-efficacy, based on previous findings that maternal age is associated with both maternal depression and parenting self-efficacy (Froman & Owen, 1990; Kessler et al., 1994) and findings that parenting demands may be especially intense during infancy and early childhood (Bornstein, 1995). These findings suggest that the strength of the relationship between maternal depression and parenting self-efficacy does not differ depending on maternal or child age.

We found support for our hypothesis that parenting experience, as measured by the percentage of the sample that was primiparous, would significantly moderate the relationship between maternal depression and parenting self-efficacy, such that the relationship was stronger in studies whose samples had a higher percentage of first time mothers. Our support for this hypothesis suggests that the relationship between maternal depression and parenting self-efficacy is stronger for first time mothers, whose parenting may have not yet been bolstered by past mastery experiences. Longitudinal studies are needed to reveal changes that occur on becoming a mother for the second or later times such that the strength of this relationship is lower relative to first time mothers.

Contrary to our hypothesis, the relationship between maternal depression and parenting self-efficacy was not stronger for mothers of lower SES. Although nearly all studies included information on some aspect of the socioeconomic status of the study sample, the nature and

extent of this information was inconsistent and varied tremendously by study. Some studies reported SES in terms of education levels, some in terms of income level, and some with broad descriptions (e.g., predominantly middle class; Ngai, Chan, and Ip (2010)). This inconsistency in the way in which SES was reported may have contributed to our findings, such that the association between maternal depression and parenting self-efficacy may vary depending on the specific aspect of SES examined (i.e., income versus education). Alternatively, it may be the association is equally strong regardless of socioeconomic status. However, research in this area would benefit from researchers reporting SES information in a more standardized manner, to better allow for comparisons across samples.

The extent to which methodological considerations moderated the association between maternal depression and parenting self-efficacy was also examined. It was hypothesized that the way in which depression was assessed would moderate the association, such that it would be stronger when a diagnostic versus self-report measures were used. Contrary to this, whether depression was assessed using a diagnostic versus self-report rating scale did not significantly moderate the relationship. Among self-report measures of depression, the specific instrument by which depression was measured was found to have moderated the relationship between maternal depression and parenting self-efficacy, such that the relationship was strongest when the Beck Depression Index (original or BDI-II) was used relative to studies that used the Center for Epidemiologic Studies Depression (CES-D) Scale or the Edinburgh Postnatal Depression Scale (EPDS). This supports our hypothesis, and the argument that the CES-D and EPDS may be less specific for depression and instead reflect general distress, whereas the BDI and BDI-II, in particular, more closely align the depressive symptoms and duration criteria in the DSM-5.

Parenting self-efficacy has been assessed using a wide variety of measures, including those that differ in their approach to the construct of parenting self-efficacy (e.g., general versus task specific). Moderator analyses were conducted in an exploratory manner, with no specific hypotheses. Results revealed that the way in which parenting self-efficacy was assessed did not significantly moderate the association between maternal depression and parenting self-efficacy. These findings suggest that maternal depression is associated with low self-efficacy in both global and specific-task parenting beliefs. Although this distinction among parenting self-efficacy constructs and measures is likely to be important in addressing other questions, our findings suggest that the distinction is not associated with variation in the strength of association with depression in mothers.

Moderator analyses were conducted to test the hypotheses that the relationship between maternal depression and parenting self-efficacy would be stronger in studies that used lower quality measures of each. Results revealed that the quality of the measure for either maternal depression or parenting self-efficacy did not significantly moderate the relationship. Across studies and measures, internal consistency was high for measures of depression and measures of parenting self-efficacy, although some studies measured parenting self-efficacy using well-established measures and some studies used scales developed specifically for the study. Finally, year of publication was examined as a potential moderator of the relationship between maternal depression and parenting self-efficacy. Findings revealed no significant moderation, suggesting that the relationship did not significantly differ for older studies compared to studies published more recently.

The third aim of this review was to integrate findings across two fields that have examined parenting self-efficacy in relation to depression in mothers: psychology and nursing.

Although there was no conceptual or methodological basis for expecting the strength of association between maternal depression and parenting self-efficacy to differ between the two fields, it was deemed important to investigate the potential moderating role of field of study in an exploratory manner, to provide assurances that there were no such differences. Indeed, the analyses revealed that the strength of the relationship between maternal depression and parenting self-efficacy did not differ when studies were conducted by researchers from one field or the other. These results are reassuring.

Given these common findings, researchers in both fields could benefit from increased collaboration and consolidation of knowledge related to maternal depression and parenting self-efficacy. Psychology could benefit from findings from nursing, particularly in terms of measurement and the use of more task-specific measures, which are more commonly used in nursing studies. Alternatively, nursing would benefit from findings related to parenting self-efficacy from psychology, which has studied this construct in relation to a wide-array of other parent characteristics, such as social support. By integrating findings across psychology and nursing, a collaborative research team has the potential to provide a clearer picture of the association between maternal depression and parenting self-efficacy. Future studies should be mutually informed, such that developments in either discipline should be incorporated and built upon, as well as address limitations in measures or theoretical models.

The fourth and final aim of this review was evaluate limitations of the published literature in order to inform future research. This review revealed several limitations in the literature on associations between maternal depression and parenting self-efficacy beliefs, imposing constraints on our ability to address several of the aims of this meta-analytic review.

While we found strong support for the relationship of maternal depression and parenting self-efficacy, we found several limitations in the published literature regarding the samples in which this relationship has been tested.

Age

Studies that met the inclusion/exclusion criteria were severely limited in the age range of children in the samples. All but one study sampled mothers whose children ranged in age from birth to early toddlerhood, with the one exception having studied mothers of children aged 10-12. Thus our test of moderation essentially tested variation within that very narrow range of all but that one study. This presented a serious limitation of our aim to study the potential moderating role of child age in the relationship between maternal depression and parenting self-efficacy. Parenting is qualitatively different when children are in infancy and toddlerhood as compared to when children are in middle childhood and adolescence, as both the role of parents and specific parenting tasks change over the course of a child's life. The changing parenting demands may have implications for mothers' parenting self-efficacy, as mothers may find one or the other more difficult or challenging. Self-efficacy beliefs are influenced by past mastery experiences, and mothers' lack of experience in the new parenting tasks may decrease their sense of parenting self-efficacy. Parenting older children may present different challenges, relative to parenting infants and young children, as adolescence is a time of heightened desire for autonomy (Steinberg, 2001), increasing activity outside the home (Larson, 2001), and changes associated with puberty, sex, and dating (Furman & Shaffer, 2003; Sagrestano, McCormick, Paikoff, & Holmbeck, 1999). Therefore, parenting tasks associated with these changes, such as establishing boundaries, rules, and navigating adolescents' identity-building, differ significantly from parenting tasks at younger ages, which involve changing diapers, feeding, dealing with irregular

sleep, etc. In addition, the most commonly used measures of task-specific parenting self-efficacy largely tap these tasks at younger ages, such as "knowing how to manage toilet training" (Toddler Care Questionnaire; Gross & Rocissano, 1988) and therefore may be inappropriate for use for parents of older children. Future research should examine parenting self-efficacy in middle childhood and adolescence, which may require the development and testing of new parenting self-efficacy belief measures.

Stability of Parenting Self-Efficacy

The stability of parenting self-efficacy, or how much and in what ways it might change over time, has been neglected in the literature. Cross-sectional studies largely assessed parenting self-efficacy at one point in time, which does not address how parenting self-efficacy changes over time; a single measurement may not be an accurate representation of a mother's overall sense of efficacy. For example, Salonen et al., (2009) measured parenting self-efficacy while mothers were still in the hospital after giving birth, and posit that the protective setting of the hospital may have caused them to overestimate their abilities. Measurement of parenting self-efficacy at one point in time may not capture the variability of self-efficacy or take into account environmental factors that may affect sense of parenting self-efficacy. Future research should examine how the association between parenting self-efficacy and depression may change over time, particularly as parenting roles change over the course of child development. See below for a related point on test-retest reliability of the measures.

Measures

All of the measures of parenting self-efficacy included in this review are self-report questionnaire measures. Although an individual's perception of her own efficacy may inherently be best measured by self-report, the measures are notably brief, with some as short as six items

(Gauthier, Guay, Senécal, & Pierce, 2010a). Many of the studies measured parenting self-efficacy with scales that were used for the first time, with no published studies reporting on their psychometric properties and minimal information provided on reliability (e.g. test-retest) and validity. In addition, implicit measures of self-efficacy may allow researchers to examine self-efficacy beliefs in a way that avoids responses biases and other problems associated with direct self-reports (Fazio & Olson, 2003).

Direction of Relationship

Although we found a medium effect size for the relationship between maternal depression and parenting self-efficacy, the research designs preclude the possibility of testing directionality of this association. Thus, the association may reflect that parenting self-efficacy predicts maternal depression or that depressive symptoms lead to lower maternal self-efficacy, or that this relationship is transactional as it unfolds over time. Alternatives to cross-sectional correlational designs are needed to examine the direction of the relationship. Experimental manipulation of self-efficacy would allow for better understanding how self-efficacy beliefs might specifically influence depression. Further, experiments in the form of intervention studies, in which either depression is being treated of parenting self-efficacy is being targeted for improvement, could reveal information about directionality by examining whether either depression or parenting self-efficacy subsequently improve relative to baseline.

Overall, while the limitations of the published literature are significant, this meta-analysis provides important information regarding the strength of the relationship between maternal depression and parenting self-efficacy. This review also identifies critical areas of future research to further elucidating the roles that parenting self-efficacy beliefs may play in relation to depression in mothers, and how either or both, potentially in relation to each other, may be

associated with adverse child outcomes. The knowledge generated by this review contributes to our ability to develop and test models of how maternal depression and parenting self-efficacy beliefs may work together in relation to maladaptive parenting. Moreover, this knowledge of the strength of the association between parenting self-efficacy and depression in mothers can inform preventative interventions or treatment; the strength of the association suggests that they should both be addressed when either is targeted.

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Table 1

Study-Level Analysis for Relationship between Mothers' Depression and Parenting Self-efficacy

	k	N	Weighted mean *r*	95% CI	Q	Fail Safe N
Parenting Self-efficacy	37	8462	-.34***	-.40, -.26	753.31	7211

*** $p < .001$

Table 2

Continuous Moderator Analyses for Mothers' Depression and Parenting Self-Efficacy

Moderator	*k*	Coefficient	Standard Error	*p*
Maternal Age	34	0.000	0.013	.99
Child Age	33	0.003	0.025	.92
Parenting Experience	18	-0.004*	0.002	.02
Socioeconomic Status	17	-0.001	0.003	.64
Quality of Depression Measure	27	-0.79	0.62	.20
Quality of PSE Measure	27	-0.02	0.37	.95
Year of Publication	37	0.00	.00	.92

*p = .05

Table 3

Construct-level Moderator Analyses for Mothers' Depression and Parenting Self-Efficacy

Level of moderator	*Qb*	*k*	Weighted mean *r*	95% CI
Assessment of mothers' depression	0.09			
Diagnosis		3	-.33	-.40/-.25
Symptom rating		34	-.36	-.49/-.20
Measure of Depression Symptoms	24.12**			
CES-D		14	-.25	-.31/-.19
BDI		9	-.43	-.47/-.39
EPDS		7	-.37	-.51/-.22
Other		3	-.31	-.59/.03
Measure of Parenting Self-Efficacy	3.18			
Domain General		21	-.33	-.42/-.24
Domain Specific		3	-.22	-.40/-.02
Task-Specific		13	-.38	-.43/-.33
Discipline	.21			
Nursing		11	-.31	-.43/-.19
Psychology		26	-.34	-.43/-.26

Note. * $p < .05$. ** $p < .001$.

Table 4

Psychometric Properties of Self-Report Measures of Depression

Measure	Number of Items	Possible Range of Scores	Timeframe	Internal Consistency	Test-retest Reliability
Beck Depression Inventory (BDI I & II)[1]	21	0-63	Past two weeks	.86	.48-.86
Center for Epidemiologic Studies Depression Scale (CES-D)[2]	20	0-60	Past week	.85	.45-.70
Edinburgh Postnatal Depression Scale (EPDS)[3]	10	0-30	Past week	.87	.92[4]

Note. Beck, Steer, and Carbin (1988). Radloff (1977)[2]. Cox et al. (1987)[3]. Kernot, Olds, Lewis, and Maher (2015)[4].

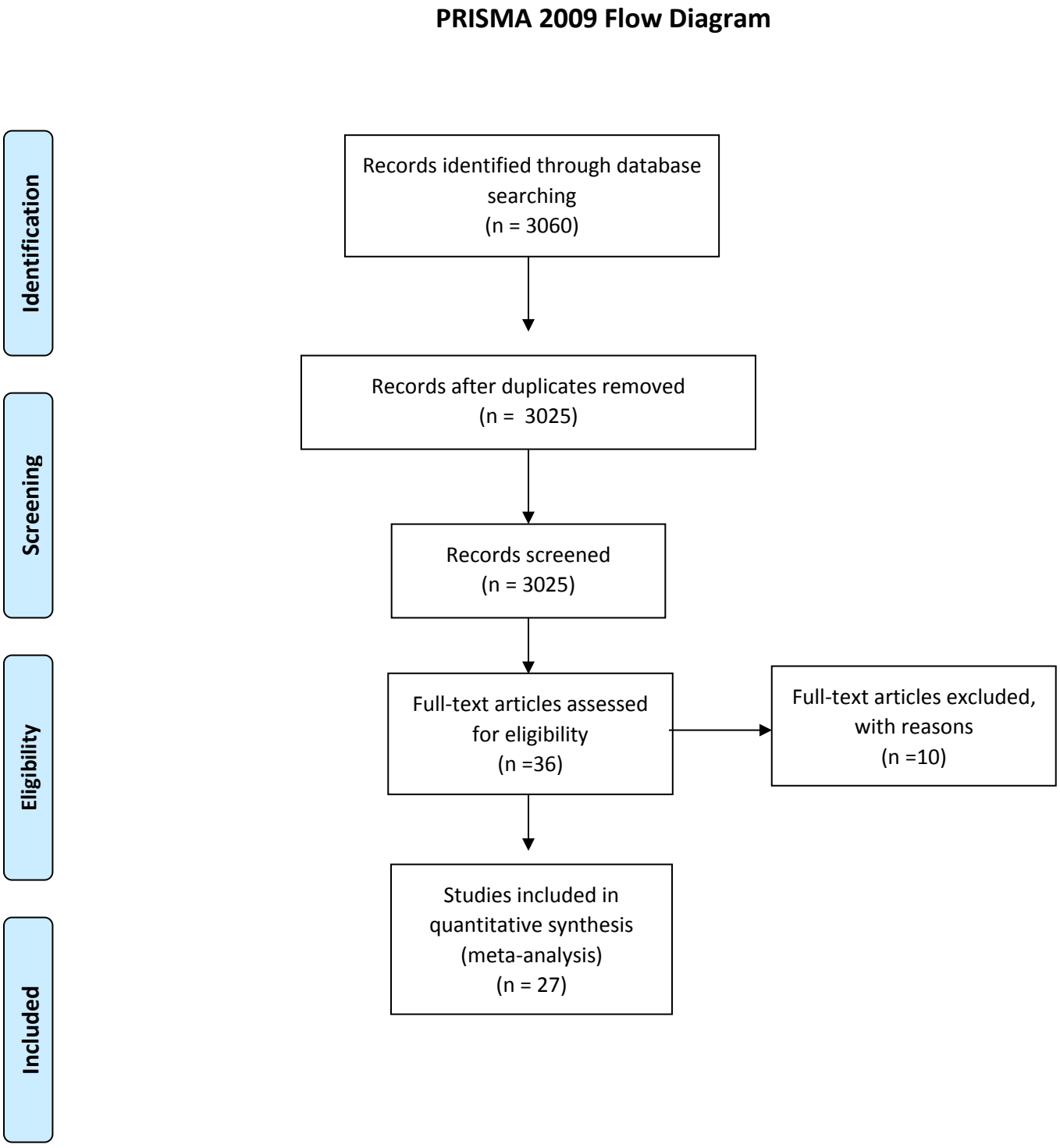
Table 5

Psychometric Properties of Measures of Parenting Self-Efficacy

Measure	Number of Items	Range of Scores	Internal Consistency	Test-retest Reliability
Five questions designed for study[1]	5	5-25	.71	N/A
6-item developed for study[2]	6	5-30	.73	N/A
Karitane Parenting Confidence Scale (KPCS)[3]	15	0-60	.81	.88
Lips Maternal Self-Confidence Scale (LMSCS)[4]	24	24-144	.88	.88
Maternal Efficacy Questionnaire (MEQ)[5]	10	0-40	.86	N/A
Parental Involvement and Efficacy Scale (PIE)[6]	18	0-90	.64	N/A
Parenting Sense of Competence Scale (PSOC)[7]	17	17-102	.80	.73
Parent Expectation Survey (PES)[8]	25	0-250	.92	.57
Self-Efficacy in the Nurturing Role[9]	16	16-112	.74	.85
Perceived Maternal Parental Self-Efficacy Scale (PMP-SE)[10]	20	20-80	.91	.96
Self-Efficacy for Parenting Tasks Index-Toddler Scale (SEPTI-TS)[11]	53	0-6	.91	N/A
Toddler Care Questionnaire (TCQ)[12]	36	36-185	.93	.87

Note. Howell, Mora, and Leventhal (2006)[1]. Barnett, de Baca, Jordan, Tilley, and Ellis (2015)[2]. Črnčec, Barnett, and Matthey (2008)3. Lips and Bloom (1988)[4]. Teti and Gelfand (1991)[5]. Diener, Nievar, and Wright (2003)[6]. Johnston and Mash (1989)[7]. Reece (1992)[8]. Pedersen, Bryan, Huffman, and Del Carmen (1989)[9]. (Barnes & Adamson-Macedo, 2007)[10]. Coleman and Karraker (2003)[11]. Gross and Rocissano (1988)[12].

Figure 1.


PRISMA 2009 Flow Diagram
Identification
Screening
Eligibility
Included
Records identified through database searching (n = 3060)
Records after duplicates removed (n = 3025)
Records screened (n = 3025)
Full-text articles assessed for eligibility (n =36)
Full-text articles excluded, with reasons (n =10)
Studies included in quantitative synthesis (meta-analysis) (n = 27)

Appendix 1. *Characteristics of Studies in Meta-Analysis*

Study	N	Mother Age (y)	Child Age (y)	% Primiparous	% low SES	Discipline	Depression Measure	Alpha Coefficient	PSE Measure	Alpha Coefficient
Barnett et al. (2015)	59	36.47	10.08	N/A	73	P	CES-D	.77	Task-specific	.73
Bor and Sanders (2004)	305	31.10	3.40	N/A	40	P	BDI	.81	Domain-general	.79
Caldwell et al. (2011)	76	28	3.69	50	78	P	SCL-90-R, Depression scale	.89	Domain-general	.79
∞ Choi, Kim, Ryu, Chang, and Park (2012)	72	30.7	.07	54.2	54.2	N	EPDS	.81	Domain-specific	.95

Cutrona and Troutman (1986)	55	27.3	.24	55	19	P	BDI	.70	Domain-general	.72
Fox and Gelfand (1994)	60	30.25	2.1	N/A	0	P	BDI	N/A	Task-specific	.78
†Gauthier, Guay, Senécal, and Pierce (2010b)	301	28.9	.04	72.5	45	P	EPDS	.82	Task-specific	.84
Gross and Rocissano (1988)	50	33	1.92	64	14	N	BDI	N/A	Domain general	.93
†∞Gross, Conrad, Fogg, and Wothke (1994)	126	31.6	1	N/A	100	N	CES-D	.88	Domain-general	.93
Haslam, Pakenham,	192	26	.07	N/A	48	P	EPDS & BDI	.85	Domain-general	N/A

and Smith (2006)										
Howell et al. (2006)	720	29.93	.07	44	26.9	P	2-item screening instrument	N/A	Domain-general	.71
Kohlhoff and Barnett (2013)	83	32.2	.44	100	N/A	P	EPDS	.85	Task-specific	.84
Knoche, Givens, and Sheridan (2007)	49	17.3	.79	100	100	P	CES-D	.84	Domain-general	.79
† Kunseler, Willemen, Oosterman, and Schuengel (2014)	822	30.15	.25	100	33	P	BDI-II	.82	Task-specific	.85
Leahy-Warren, McCarthy, and Corcoran (2012)	410	Not provided	.11	100	20	N	EPDS	.88	Domain-general	.89

† Michl et al. (2015)	127	25.03	1	N/A	100	P	Diagnostic Interview Schedule for DSM-IV	K=.69	Task-specific	.78
Ngai et al. (2010)	184	31.3	.11	100	4	N	EPDS	.86	Domain-general	.87
O'Neil, Wilson, Shaw, and Dishion (2009)	607	26	2	N/A	64	P	CES-D	.89	Domain-general	.74
†Porter and Hsu (2003)	50	27.28	.02	100	0	P	BDI	N/A	Task-specific	.78
Sanders and Woolley (2005)	124	34.23	4.21	N/A	24.2	P	Depression subscale, DASS	.94	Domain-general	.67
*Schuetze and Eiden (2005)	263	26.99	3	100	80.5	P	CES-D	N/A	Domain-general	.70
Sevigny and Loutzenhiser (2010)	62	32.4	2.27	66.1	21	P	BDI-II	.85	Task-specific	.92

Teti and Gelfand (1991)	86	28.44	.61	N/A	68.4	P	BDI	N/A	Task-specific	.86
Vargas and Tucker (2015)	136	31.75	N/A	N/A	68.4	P	CES-D	.8	Domain-specific	.81
† Weaver, Shaw, Dishion, and Wilson (2008)	652	N/A	2.5	N/A	66	P	CES-D	.73	Domain-general	.69
Zayas, Jankowski, and McKee (2005)	79	24.66	.25	40	36	P	BDI-II	.86	Domain-general	.73
Zietlow, Schlüter, Nonnenmacher, Müller, and Reck (2014)	54	32.81	4.74	100	100	P	SCID	N/A	Domain-general	.87

Note. *This study was identified as an outlier and removed from moderator analyses. † Study assessed the relationship between maternal depression and parenting self-efficacy across multiple

time points. The first time point is reported here. ∞ Study included multiple sub-groups. The first subgroup is reported here.