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Darien (Penny) McElwee April 14, 2020

First-Time Mothers' Parenting Self-Efficacy: Correlates and Determinants

by

Darien (Penny) McElwee

Dr. Sherryl H. Goodman
Adviser

Department of Psychology

Dr. Sherryl H. Goodman

Adviser

Dr. Patricia Brennan

Committee Member

Dr. David Fisher

Committee Member

2020

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Darien (Penny) McElwee

Dr. Sherryl H. Goodman

Adviser

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Abstract

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Parenting self-efficacy (PSE) is a mother's belief in her ability to raise a child. High PSE has been shown to be associated with several emotional benefits for the mother and child, including fewer depression symptoms, better adjustment to the parenting role, and less use of coercive discipline. Because of these beneficial outcomes, it is crucial to investigate factors associated with high PSE. The present study was particularly interested in factors that are associated with and influence PSE in first-time mothers of infants. First-time mothers experience a unique transition period that requires delicate care for their own postpartum health, while also caring for the multifaceted needs of a newborn. Based on the published parenting literature, we identified social support, prior experience with children, knowledge of child development, child temperament, mood, and mastery experiences as potential correlates and determinants of PSE. We examined PSE with two measures in order to assess both task-specific and domain-general PSE. A sample of 30 mothers with infants ranging from 4 to12 months of age completed questionnaires online and also participated in a lab visit. During the lab visit, mothers participated in an established mood manipulation to examine how sad mood affects PSE and a novel mastery experience that involved recalling and writing about a time when they had successfully handled a challenging parenting task. Pearson's correlations were conducted to test associations with both PSE scores. Paired t-tests were conducted to analyze changes in PSE after the sad mood induction and after the mastery experience. In line with our predictions, we found that greater self-reported infant surgency was significantly associated with higher task-specific PSE scores. Other correlations were in the predicted direction but were small and not statistically significant: association between greater social support, more prior experience with children, and greater surgency were positively correlated with domain-general PSE. The results from the lab visit revealed that mothers' PSE was significantly lower after the sad mood induction, as well as after the mastery experience. The results of this study extend the current literature on factors associated with PSE in first-time mothers of infants. These findings can also readily be implemented in interventions aimed to increase parenting confidence in new mothers.

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First-Time Mothers' Parenting Self-Efficacy: Correlates and Determinants

Mothers' parenting self-efficacy (PSE) is their beliefs about their ability to successfully perform child-raising tasks. PSE is associated with several important concerns for both the mother and child (Teti & Gelfand, 1991). Mothers with higher PSE report fewer depression symptoms, better adjustment to the parenting role, and fewer perceived difficulties in their child (Hess, Teti, & Hussey-Gardner, 2004). Furthermore, children of mothers with higher PSE receive less coercive discipline, have better classroom behavior, and have lower rates of problem behavior (Weaver, Shaw, Dishion, & Wilson, 2008). Although these studies underscore the importance of PSE, they leave unanswered key questions about what factors are associated with PSE, especially in the first several months of adjusting to the parenting role for the first time. Important next steps in this area of research, addressed by the present study, are to elucidate correlates of PSE in first-time mothers of infants, as well as determine the extent to which transient emotions and mastery experiences influence PSE. Transitioning to motherhood for the first time poses unique challenges. New mothers must learn many new skills and continuously adapt to the changing needs of their newborn's many dependencies in addition to caring for their own postpartum physical and emotional health (Rutledge & Pridham, 1987).

Potential Correlates of PSE

PSE and Social Support. Extensive theoretical and empirical work on social support suggests a likely link between mothers' social support networks and their PSE in the first year of life of healthy infants. Yet, most studies investigating the relationship between PSE and social support have largely focused on the relationship between PSE, social support, and parenting stress. The findings from these studies suggest that social support can ease stress from financial insecurity (Raikes & Thompson, 2005), while family conflict is negatively associated with PSE

(Cassé, Finkenauer, Oosterman, van der Geest, & Schuengel, 2018). We found no published studies that directly examine the association between social support and PSE. Based on these findings, it is plausible that new mothers adjusting to stressors associated with the transition to parenthood would also find greater social support from friends, family, and significant others to be associated with their higher PSE. Therefore, we hypothesized that first-time mothers with a stronger social support system, as shown by more self-reported availability of friends, family, and significant others who are able to assist with childcare, will be associated with higher PSE.

PSE and Prior Experience with Children. To our knowledge, no published studies have examined how experience with children prior to parenthood relates to PSE in first-time mothers of infants. Yet, Belsky's (1984) model of the determinants of parenting emphasizes that adolescent work opportunities, such as babysitting, prepare youth for the parenting role through socialization with younger children. Further, Coleman and Karraker (2000) found that greater experience with children during adolescence was moderately correlated with higher PSE in mothers of school-age children. Thus, we hypothesized that the positive association between more prior experience with children and higher PSE will also hold true for new mothers of babies.

PSE and Knowledge of Child Development. We also found no published studies of the relationship between PSE and knowledge of child development in new mothers of infants. Mothers' knowledge of infants' developmental abilities varies widely (Reich, 2005) and is positively associated with health benefits such as less parental stress and fewer anxiety and depression symptoms (Barlow, 1997; Barlow & Coren, 2000; Culp, Culp, Blankemeyer, & Passmark, 1998; Honig & Wittmer, 1991). In terms of greater knowledge of child development being associated with PSE, we found one published study reporting that mothers of toddlers were

moderately more competent in infant play interactions when both their PSE and knowledge of child development were high (Conrad, Gross, Fogg, & Ruchala, 1992). Given this pattern of findings, we hypothesized that greater knowledge of child development will be positively correlated with higher PSE.

PSE and Infant Temperament. Two findings suggest that infant temperament may be associated with first-time mothers' PSE. First, difficult infant temperament has been linked to postpartum depression through its effect on PSE, such that mothers—both first-time and of multiple children—who perceived their child's temperament as "difficult" tended to report more self-blame, which was subsequently associated with greater depression symptoms (Cutrona & Troutman, 1986). Second, among Dutch first-time mothers, lower PSE prospectively predicted mothers' report of higher infant negative reactivity and lower infant soothability (Verhage, Oosterman, & Schuengel, 2013). The present study sought to investigate the relationship between PSE and infant temperament among first-time mothers of infants, relying on well-established conceptualizations and measurement of infant temperament (Rothbart, 1981). We hypothesized that positive qualities of infant temperament such as extraversion and effortful control will be positively associated with PSE, while difficult aspects of infant temperament such as negative affectivity will be negatively associated with PSE.

PSE and Mood. One of the best-documented correlates of PSE is that higher symptom levels of depression are associated with lower PSE (Bandura, 1989; Cutrona & Troutman, 1986; Muris, 2002; Teti & Gelfand, 1991). This association is typically interpreted to suggest that both depression and PSE are stable individual difference characteristics. Given these assumptions, it is not surprising that the relationship between PSE and mood fluctuations has largely been ignored. Yet, contrary to depression symptom severity, which tends to be highly stable over time—

including among mothers of infants (Abdollahi, Zarghami, Sazlina, & Lye, 2017)—mood is a transitory state of commonplace emotions such as happiness or sadness that affects almost everyone. Moreover, little is known about the stability of PSE, specifically if and how PSE changes over time, because previous research was primarily cross-sectional and few studies report test-retest reliability of PSE (Simon & Goodman, 2017). Thus, the current study takes an important next step in this line of research by aiming to explore the relationship between PSE and mood, with a particular concern about sad mood. We hypothesized that mothers will report lower PSE beliefs when in a sad mood compared to at a baseline mood state.

PSE and Mastery Experiences. Mastery experiences—situations where one was able to successfully overcome a challenging task—are a major source of self-efficacy beliefs (Bandura, 1977). Mastery experiences are a particularly significant source of efficacy information, because mastery experiences are based on prior experiences, such that successes lead to positive future expectations while failures are associated with negative future expectations. Given mastery experiences' significant impact on self-efficacy beliefs, we were interested in testing the extent to which mastery experiences can increase PSE. We hypothesized that mothers will report higher PSE beliefs after recalling a parenting mastery experience compared to baseline. Support for this hypothesis would not only strengthen the theory of self-efficacy as a major cognitive mechanism affecting the acquisition and retention of behavior, but also has implications for designing clinical interventions to help raise PSE in mothers who are struggling to adjust to the parenting role.

The Current Study

The present study aims to advance our scientific understanding of the correlates and determinants of parenting self-efficacy in first-time mothers of infants by (a) examining various correlates of parenting self-efficacy and by examining changes from baseline parenting self-efficacy in relation to (b) experimentally manipulated mood and (c) a novel mastery experience manipulation. We sampled mothers of infants between the ages of 4 and 12 months given that the first months of life pose a challenge to all women as they adapt to motherhood, and conversely, mothers of infants beyond the first year of life begin to face other new challenges such as children's increasing autonomy as they begin to walk.

Given that the transition to motherhood in the first months of life pose unique challenges as women adjust to caring for themselves as well as their infant, it is pertinent to understand factors that are positively associated with women feeling more or less confident in their parenting abilities during this phase. We hypothesized that higher perceived social support, more prior experience with children, and greater knowledge of child development will be associated with higher PSE. Furthermore, we hypothesized infants with temperaments displaying more extraversion, more effortful control, and less negative affectivity will be associated with higher PSE. A clearer understanding of the correlates of PSE in first-time mothers of infants can greatly enhance clinical practice by informing interventions aimed at increasing new mothers' parenting self-efficacy.

This study also utilized mood induction, using film and music, to study how changes in mood might affect PSE—an experimental manipulation not seen in the published literature on PSE. By experimentally manipulating mood, we were able to directly test how changes in mood might lead to changes in PSE. This experimental manipulation allows us to better understand if fluctuations in sad mood may affect one's belief in their parenting abilities. This is in sharp

contrast to the majority of the literature's assumption that PSE is a stable individual difference variable. We hypothesized that participants will report lower PSE beliefs when experiencing a sad mood compared to baseline. If PSE fluctuates with mood, this would provide a theoretical basis for understanding PSE as a dynamic trait that is malleable and could be improved during intervention.

Lastly, the current study employed a novel parenting mastery manipulation where mothers were asked to reflect and write about a time they successfully completed a challenging parenting task. The inclusion of the mastery manipulation is a necessary step in evaluating the theoretical self-efficacy framework presented by Bandura in 1977. We found no published study that tested whether recalling a mastery experience could raise PSE. We hypothesized that mothers would experience more positive mood after the mastery experience, relative to baseline, and that they would report higher PSE beliefs after recalling a parenting mastery experience than at baseline. In addition to advancing theory, successful demonstration of the mastery experience manipulation would suggest a potential new technique to raise PSE that could be implemented in parenting interventions or in home settings.

Method

Participants

Thirty first-time mothers of infants aged 4-12 months (46.7% female) in Atlanta, Georgia were recruited through flyers, word of mouth, social media, and the Emory Child Study Center database of mothers who expressed interest in participating in research studies. A power analysis suggested that a sample size between 21 and 32 would detect an effect size between 0.2 and 0.25. The sample was diverse in ethnicity, income, and education level: 24.1% of the women were Black, 13.8%

were Asian, and 62.1% were White; none were Hispanic. 16.7% of families earned less than $50,000 in the last year, 23.4% earned between $50,000 and $100,000, 43.3% earned between $100,000 and $149,000, and 16.7% earned more than $150,000. Although the majority of the sample were highly educated (59.9% held a post-graduate degree), 26.7% held a bachelor's degree as their highest level of education, and 13.4% attended some college or earned an associate's degree. Six participants completed the pre-lab questionnaire but did not complete the lab visit. Their descriptive statistics were not significantly different from the group of 30 with complete data, and thus, their data were omitted from the remainder of the analyses.

Procedure

The study protocol was approved by the Emory University Institutional Review Board (IRB00113843).

After a brief phone screen to determine eligibility (age of infant, first-time mother, fluent in English, no infant chronic medical conditions or disabilities, singleton birth), women were sent a link to complete an online questionnaire using Qualtrics XM. The questionnaire began with the informed consent form and participants provided an electronic signature if they agreed to participate in the study. Next, women provided demographic information on their race, ethnicity, income, and education level. Subsequently, participants completed measures of baseline PSE, perceived social support, prior childcare experiences, knowledge of child development, and their infant's temperament.

After completion of the online survey, participants were scheduled for a 20-minute laboratory visit in the Children's and Mother's Emotions Lab. Participants were seated alone in front of a computer with a headset in a distraction free environment. All lab procedures were built into a Qualtrics survey. The mothers began by listening to 1 minute of "The New World"

by Dvorak with their eyes closed. "The New World" by Dvorak is a classical music piece that has been validated to induce a neutral mood (Pacheco-Unguetti et al., 2016; Palmiero et al., 2015; Palmiero et al. 2016). We began with this piece to enhance the likelihood that each participant started the experiment in a neutral mood. The women then completed a mood check and two PSE measures.

After the neutral mood induction, participants watched a 6-minute clip from the movie, *The Champ* in full screen. This video clip has been shown to reliably induce sad mood in a variety of studies (Le, 2019; Newman & Sears, 2015; Rodriguez et al. 2015). After the clip ended, mothers completed a mood check and two PSE measures, with instructions to respond with how they are feeling in the moment.

Following the sad mood induction, mothers were shown the video clip, *Alaska's Wild Denali* for 2.5 minutes to facilitate return to neutral mood. *Alaska's Wild Denali* has been used as a neutral mood induction video across various studies (Bravo, 2016; Lindgren et al. 2018; van Beveren, 2019). After the clip ended, participants completed a mood check.

After completing the video segments, participants began the mastery experience segment. Mothers were asked to "write a detailed story about a time you successfully completed a specific, challenging parenting task." They were instructed to recall and then write about the situation including the setting, people present, the task, and their emotions at the time. Mothers were given one minute to think of a situation and five minutes to type the details of the experience into a box within Qualtrics. The participants then completed a mood check and two PSE measures, again asking them to respond based on how they feel in the moment.

Measures

Parenting Self Efficacy (PSE). Mothers completed two measures of PSE in order to capture potential differences in the relationship among correlates. The first measure of PSE was task-specific. Task-specific PSE assesses confidence in specific parenting tasks, such as feeding or playing with the baby. The second measure of PSE was domain-general. Domain-general PSE assesses general attitudes about being a mother and confidence in parenting broadly, such as if one feels uneasy around the baby.

` Task-specific PSE was assessed using the Karitane Parenting Confidence Scale (KPCS; Črnčec, Barnett, & Matthey, 2008). The KPCS is a 15-item self-report scale that measures domain-specific self-efficacy in mothers of 0 to 12-month-old infants. Mothers are asked how confident they are about several parenting tasks, such as feeding, soothing, and playing. The KPCS item responses are on a 4-point scale from 0 (*no, hardly ever*) to 3 (*yes, most of the time*). The KPCS yields a total score, with the highest possible value of 45. Higher scores indicate higher confidence. The KPCS has been used in various studies across cultures to measure perceived parenting self-efficacy (Pereira et al. 2018; Pontoppidan et al. 2019; Usui et al. 2019). The KPCS was chosen to measure PSE in this study because the KPCS scored the highest on a systematic review of reliability, validity, and ease of use across 34 self-report measures of parenting-self efficacy (Wittkowski, Garrett, Cala, & Weisberg, 2017). In our sample, the KPCS had a Cronbach's alpha of 0.615. However, the meta-analysis rated the KPCS a perfect score on reproducibility, internal consistency, criterion validity, and construct validity.

In addition to the total score, the KPCS yields scores on three factors: parenting, support, and child development. We were most interested in how changes in mood would change responses to the parenting factor. The parenting factor consists of 8 items, such as "I know what to do when my baby cries" and "I understand what my baby is trying to tell me." The parenting

factor highlights parenting confidence and may be more variable, as opposed to support ("I feel supported by my partner") or child development ("I am confident my baby is doing well"). However, the authors recommend using the total score rather than the score of one factor. Thus, participants completed the full scale and we tested our hypotheses with both the full scale score and with the parenting factor score alone.

Domain-general PSE was assessed using the Being a Mother scale (BAM-13; Matthey, 2011). The BAM-13 is a 13-item self-report scale that measures women's feelings about motherhood. For example, the survey asks participants to respond to statements such as "I have not felt close to my baby" and "I worry I am not as good as other mothers." The BAM-13 items are on a 4-point scale from 0 (*Yes, most or all of the time*) to 3 (*No, rarely or never*). This results in a maximum total score of 39, with higher scores indicating more positive feelings toward motherhood. This scale is valid for women in the early postnatal weeks up to 3-4 years postpartum (Matthey, 2011), was found to have a Cronbach's alpha of 0.798, and has been used to measure mothers' feelings toward parenthood (Henshaw, Fried, Siskind, Newhouse, & Cooper, 2015; Henshaw, Fried, Teeters, & Siskind, 2014). We chose to use the BAM-13 to measure domain-general PSE because this measure scored the second highest on the systematic review of parenting self-efficacy measures (Wittowski et al., 2017). In our sample, the BAM-13 had a Cronbach's alpha of 0.831.

Perceived Social Support. To assess perceived social support, participants completed the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). This scale is a 12-item self-report measure, with participants responding to each item on a 7-point scale from 1 (*very strongly disagree*) to 7 (*very strongly agree*). Participants are instructed to rate how they feel about statements describing perceived support from

significant others, family, and friends. For example, participants rate how they feel about statements, such as "there is a special person who is around when I am in need", "my family really tries to help me", and "I can count on my friends when things go wrong." The MSPSS score is a mean, calculated by adding the score of each item and dividing by the total number of items. A mean scale score from 1 to 2.9 is considered low support; a score of 3 to 5 is considered moderate support; a score from 5.1 to 7 is considered high support. Cronbach's alpha for the significant other, family, and friends subscales were .91, .87, and .85, respectively. The alpha of the scale overall was .88. (Zimet et al.,1988). Additionally, the test-retest reliability after two to three months of the significant other, family, and friends subscales were .72, .85, and .75, respectively. In our sample, the MSPSS had a Cronbach's alpha of 0.940. The MSPSS also has good construct validity. Predictive validity has also been demonstrated by higher social support scores in each subscale having been shown to be negatively correlated with more depression. Although originally developed in studies of undergraduate students, the MSPSS has been used to assess adult and parent perceived social support in several studies (Martins, Peterson, Almeida, & Costa, 2011; Respler-Herman, Mowder, Yasik, & Shamah, 2012; Stewart, Umar, Tomenson, & Creed, 2014).

Prior Experience with Children. Participants were asked about their prior experience with children using Question 1 (5 items) of the Survey of Childcare Experiences (SCCE; MacPhee, 2002). Question 1 asks participants how often they interacted with children in five different settings: babysitting a sibling when growing up, babysitting other children when younger, babysitting children as an adult, volunteering in a nursery or Sunday school, and in a professional setting, such as nursing or social work. It asks participants how often they interacted with children in each of these settings on a 5-point scale from 0 (*never have)* to 4 (*every few*

days). Each participant's total score was calculated to determine their amount of prior experience with children, with a potential range from 0 to 25. Higher scores indicate more prior experience with children. In our sample, the SCCE had a Cronbach's alpha of 0.651. The SCCE includes similar items that can be found in Clark-Stewart (1978) and Ninio (1979) with additional information added based on conversations with parents. The face validity of the SCCE is strong given that it assesses informal experiences with children and formal education in parenting. Higher scores on informal experiences with children on the SCCE are strongly related to one's confidence in one's knowledge of child development, although inversely related to accurate knowledge of child development (Macphee, 2002). Although we did not find any published studies which used the SCCE to measure prior experience with children, we also did not find a widely used metric to measure prior childcare experiences. Thus, we used the SCCE given its face validity.

Knowledge of Infant Development. Participants were surveyed on their knowledge of infant development using the Knowledge of Infant Development Inventory short form (KIDI short form; MacPhee, 1981). The KIDI short form is a 20-item self-report survey which has been used in several studies (Nuttall, Valentino, Wang, Lefever, & Borkowski, 2015; Pereira et al. 2016; Smith, 2016) to assess participants' awareness of major child milestones from birth to three years old. The first 9 questions ask participants whether they "agree", "disagree" or are "not sure" about a variety of infant behaviors. For example, one statement from this section is "if you punish children for doing something naughty, it's okay to give them a piece of candy to stop the crying." Participants are given one point for each correct answer. "Not sure" does not receive any points. After responding to the 9 statements, participants are shown 11 statements about potential child milestones. Participants can either select "agree" or "disagree" to these

statements. For example, one statement is "babies usually say their first real word at 6 months." If the participant agrees, they move on to the next question. If the participant disagrees, the participant selects if this behavior is displayed when the infant is "younger", "older", or they are "not sure." One point is awarded for each correct answer. The KIDI short form yields a maximum total score of 20, with higher scores indicating more knowledge of child development. Higher scores on the KIDI short version have been shown to be positively correlated with maternal education but negatively correlated with maternal depressive symptoms (Huang, Caughy, Genevro, & Miller, 2005). The KIDI also has good face validity and content validity. The KIDI demonstrated good short term consistency (r = 0.92), test-retest reliability after 4 months (r = 0.65) and after a year (r = 0.61), and internal consistency across studies ranging from 0.80 to 0.86 (Bert, Guner, & Lanzi, 2009; Macphee, 1981). In our sample, the KIDI had a Cronbach's alpha of 0.438.

Infant Temperament. Infant temperament was assessed using the Infant Behavior Questionnaire Revised-very short form (IBQ-R VSF; Rothbart 1981). The IBQ-R VSF is a 37-item survey which asks mothers to rate the frequency that they have observed various infant behaviors over the past 7 days on a 7-point scale from 1 (*always*) to 7 (*never*). The IBQ-R is the gold-standard of infant temperament measurement and was designed to measure temperament in 3 to 12-month-old infants. Examples of infant behaviors in the items are laughter when playing, whimpering during naptime, fussiness when left alone, and enjoyment when being held. The IBQ-R VSF measures 3 domains of infant temperament: surgency (positive affect), negative affect, and effortful control (attention and focus). The summed score for each domain is divided by the total number of questions answered per section to calculate the domain's mean score with a potential range from 1 to 7. Higher scores indicate higher prevalence of the domain's trait. In a

study of the internal consistency of the IBQ-R VSF, 35 out of 36 studies reported the surgency, negative affect, and effortful control subscales to have alpha coefficients of at least 0.70. Additionally, the surgency, negative affect, and effortful control subscales of the IBQ-R VSF have estimated retest reliability scores of 0.64, 0.88, and 0.70, respectively over a variety of time spans including 2, 4, 5, 7, 9, and 11 month intervals (Putnam et al. 2014). Based on these results, Putnam and colleagues suggested that the IBQ-R VSF is a valuable tool for researchers who wish to assess temperament without the time-intensive process of administering the original, 191-question IBQ-R. In our sample, the surgency, negative affectivity, and effortful control domains had Cronbach's alphas of 0.719, 0.784, and 0.688, respectively.

Mood Manipulation Check. During the laboratory visit, the mood manipulation check was conducted using a visual analogue mood scale programmed into Qualtrics. Visual analogue mood scales are currently one of the most widely used measures for assessing the effectiveness of a mood manipulation (Cardi, Leppanen, Leslie, Esposito, & Treasure, 2019; Dowlati, de Jesus, Selby, Fan, & Meyer, 2019; Green, Pizzagalli, Admon, & Kumar, 2019). Based on Machado, Thompson, and Brett's (2019) study of assessing mood states in healthy adults, we employed a 100-point visual analogue mood scale. Participants used a slider to indicate the value that they felt characterized how "happy", "sad", and "calm" they felt from 0 (*not at all*) to 100 (*extremely*).

Approaches to Analyses

Preliminary and Descriptive Analyses. To characterize the demographics of our sample, we calculated the mean, standard deviation, and range of mothers' and infants' ages in

years and months, respectively. We also calculated proportions to determine the distribution of the infants' sex, as well as mothers' ethnicity, household income, and education level.

Pre-lab Questionnaire Correlates. We ran Pearson's correlation coefficients between the two PSE measures—total KPCS and total BAM-13 score—and the scores from each of the measures of the hypothesized PSE correlates—social support, prior experience with children, knowledge of child development, and the three domains of infant temperament. We classified correlations as small (0.2 to 0.49), moderate (0.5 to 0.79), and large (0.8 to 1.0) based on Cohen's effect size index (Cohen, 1988).

Lab Visit Hypothesis Testing. Prior to testing the predicted changes in PSE with the two experimental manipulations, we checked the effectiveness of the manipulations on altering mood, as intended. We did so by conducting three paired t-tests comparing happiness, sadness, and calmness levels that women reported following the first neutral condition versus after the sad mood induction. Similarly, we ran three paired t-tests comparing happiness, sadness, and calmness levels that women reported following the first neutral condition versus those emotions after the mastery experience.

To examine the effect of the sad mood manipulation on PSE, we conducted three paired t-tests between PSE after the first neutral mood induction and PSE after the sad mood induction, one t-test with each of the three indices of PSE: the total KPCS score, the parenting factor of the KPCS, and the total BAM-13 score. Similarly, to examine the effect of recalling a mastery experience on PSE, we conducted three paired t-tests between PSE after the first neutral mood induction and PSE after the sad mood induction, one t-test with each of the three indices of PSE: the total KPCS score, the parenting factor of the KPCS, and the total BAM-13 score.

Results

Preliminary and Descriptive Analyses

Table 1 displays the descriptive statistics for the participants' scores on each of the PSE measures and correlates from the pre-lab questionnaire.

Among the distributions of scores, the KPCS had a positive skew, such that most respondents self-reported high task-specific PSE. The highest score on the KPCS is 45 with the modal score being a 40. As a result of the positive skew of the total KPCS, the scores on the parenting factor also had a positive skew. Participants reported an even spread of scores on the BAM-13. The highest possible score on the BAM-13 is a 39 and scores ranged from 15 to 38, with the modal score being a 28. The two PSE measures were correlated with each other with a medium effect size (see Table 2).

The MSPSS also had a well-distributed range of scores. Mean scores on the MSPSS range from 1 to 7. In our sample, participants reported a range of scores from 2 to 7 with two modal scores: 5.75 and 7. The SCCE had a slight negative skew with 53.3% of participants having 4 or less prior experiences with children out of a total of 15. The modal response was 3 prior experiences. The KIDI had a slight positive skew. In our sample, the lowest score on the KIDI was 11 and the highest score was 20, with the modal score being a 15 or a 16. The surgency, negative affectivity, and effortful control domains of infant temperament were each well-distributed.

Relationships between Parenting Self-Efficacy Measures and Predicted Correlates

Table 2 provides the correlations between each of the two PSE measures and each of the hypothesized correlates in the first two columns of data. The other entries show the correlations among the hypothesized correlates.

Our hypothesis that social support, as measured by the MSPSS, would be positively associated with PSE was not supported for the KPCS but was somewhat supported for the BAM-13. There was essentially no relationship between scores on the KPCS and the MSPSS. More or less social support was not associated with more or less confidence in completing parenting tasks. In contrast, there was a small, positive, although non-significant relationship between the BAM-13 and the MSPSS. Higher scores on the MSPSS were correlated with higher scores on the BAM-13, meaning that mothers with higher perceived social support felt more confident in their general attitudes about being a mother.

Our hypothesis that more experience with children before motherhood would be associated with greater PSE was not supported for the KPCS but was somewhat supported for the BAM-13. There was a negative, albeit near-zero and non-significant relationship between the KPCS and the SCCE. However, somewhat consistent with our hypothesis, there was a near-small, positive, non-significant relationship between the BAM-13 and the SCCE. Higher scores on the SCCE were correlated with higher scores on the BAM-13, meaning that mothers with more prior experiences with children reported more confidence in general attitudes towards being a mother.

Our hypothesis that greater knowledge of child development would be associated with higher PSE was somewhat supported for the KPCS but not supported for the BAM-13. There was a small, positive, albeit non-significant relationship between the KPCS and the KIDI. Higher

scores on the KPCS were correlated with higher knowledge of infant development, such that mothers with more knowledge of child development reported more confidence in completing parenting tasks. In contrast, there was a slight positive, non-significant association between the BAM-13 and the KIDI. Higher scores on the KIDI, i.e. more knowledge of child development, were not associated with scores on the BAM-13, i.e. confidence in completing parenting tasks.

Our hypothesis that the positive aspects of infant temperament would be positively correlated with PSE, while the challenging aspects would be negatively correlated with PSE, was partially supported for the KPCS. There was a small, positive, significant association between surgency scores and the KPCS, such that higher perceived infant surgency was associated with higher scores on the KPCS. Mothers who perceived their infants as more sociable and extraverted reported more confidence in completing parenting tasks. Further, there was a small, negative, non-significant association between perceived infant negative affectivity and the KPCS, such that higher perceived infant negative affectivity was associated with lower scores on the KPCS. Mothers who reported that their infants were fussier reported less confidence in ability to complete parenting tasks. Lastly, there was a slight positive, non-significant association between perceived infant effortful control and the KPCS. There was little association between scores on the effortful control domain and the KPCS.

Our hypothesis that the positive aspects of infant temperament would be positively correlated with PSE, while the challenging aspects would be negatively correlated with PSE, was not supported for the BAM-13. There was a near-small, positive, non-significant association between self-reported infant surgency and the BAM-13. Higher self-reported infant surgency was associated with higher scores on the BAM-13, meaning that mothers who reported that their infants were more sociable reported more confidence in general feelings towards motherhood.

For both negative affectivity and effortful control, there was a slight positive, non-significant correlation with the BAM-13. Scores on the negative affectivity and effortful control domains had little association with scores on the BAM-13.

Effect of Mood and Mastery Experience on Parenting Self-Efficacy

Mood Manipulation Check for Sadness Mood Induction

Before testing the hypothesized changes in PSE in relation to experimentally induced sad mood and the mastery experience, we examined descriptive statistics to evaluate the effectiveness of the mood induction and the effect of describing a mastery experience on mood. Table 3 displays the results of the two manipulations on mood. Paired t-test results revealed that the sad video successfully induced a sad mood based on a significant increase in the mean sad mood rating before and after watching the sad video. The participants also reported feeling significantly less happy and less calm after watching the sad video relative to before watching the sad video. With the mastery experience manipulation, participants reported more happiness following the mastery experience manipulation relative to their mood just prior to the mastery experience manipulation, i.e. after watching the neutral video. Further, they reported less neutral and more calmness moods following the mastery manipulation, relative to prior to the mastery experience manipulation, i.e. after the neutral video. Later, we discuss the other findings shown in Table 3, i.e. the comparisons between the two neutral conditions on the three mood scales.

Test of Hypothesized Effect of Sad Mood Induction on Parenting Self-Efficacy

Next, we tested our hypothesis that mothers' PSE would decrease when in a sad mood relative to when in a neutral mood. Table 4 reports the changes in mothers' PSE after the sad mood induction relative to after the initial neutral mood induction, just prior to the sad mood

induction. Our hypothesis that PSE would decrease after the sad mood induction was partially supported. Consistent with our hypothesis, scores on the total KPCS and parenting factor of the KPCS significantly decreased after watching the sad video relative to after a neutral condition. Mothers felt less confident in their ability to successfully complete parenting tasks in general and specifically with regard to tasks such as feeding and playing with the infant following the sad mood induction compared to their parenting beliefs measured following a neutral condition. In contrast, and contrary to our prediction, there was no significant change in scores on the BAM-13 after the sad mood induction relative to the neutral condition, meaning that mothers' general confidence in being a mother did not change when sad mood was induced.

Mood Manipulation Check for Mastery Experience

As shown in Table 3, the second neutral mood induction did not return participants' happy and sad mood back to baseline, i.e. their levels of mood following the initial neutral mood induction (the music). Rather, although their levels of calmness did not differ between the two neutral conditions, the participants' reports of sadness were significantly higher and their reports of happiness were significantly lower following the second neutral mood induction relative to their earlier scores following the first neutral condition. Thus, the participants entered the mastery experience segment significantly sadder and less happy than when they began the experiment. Nonetheless, consistent with our hypothesis, recalling the mastery experience significantly increased participants' feelings of calmness and happiness and decreased feelings of sadness relative to their mood reports following the second mood induction.

Test of Hypothesized Effect of a Mastery Experience on Parenting Self-Efficacy

Table 5 reports the results of the paired t-tests of differences in PSE after the first neutral mood induction versus after describing the mastery experience. Contrary to the hypotheses, after recalling the mastery experience, relative to after a neutral mood induction, mothers had lower scores on the total KPCS and the parenting factor of the KPCS, and there was no significant change in their the BAM-13. Recalling a mastery experience resulted in mothers feeling less confident in their ability to successfully complete parenting tasks and no effect on their positive feelings about being a mother.

Discussion

The purpose of the current study was to extend the understanding of factors that contribute to PSE in first-time mothers of healthy infants. To do so, we analyzed correlations between two approaches to measuring PSE and various factors that theory and published findings suggested may be associated with PSE, including social support, prior experience with children, knowledge of child development, and the infant's temperament. We also experimentally manipulated mood using music and videos to characterize the extent to which changes in mood affect PSE. Lastly, we investigated the effectiveness of recalling a mastery experience as a technique to raise PSE.

The findings overall provided minimal support for the hypothesized correlates of PSE. In terms of findings with at least small effect sizes (0.20 or higher), regardless of statistical significance, focusing first on the task-specific domain of PSE, as measured with the KPCS, mothers' higher confidence in their ability to parent their child was associated with mothers' having more knowledge of child development and with the mothers rating their infants as being higher in surgency and lower in negative affectivity, two of the three domains of infant temperament. The positive relationship between knowledge of child development and greater

PSE suggests that greater understanding of typical child behaviors and developmental milestones may help mothers feel more confident in completing parenting tasks such as feeding and soothing. The association with surgency temperament suggests that infants who display more positive affect may be more sociable during playtime or more easily soothed, thereby having the positive effect of mothers feeling more confident in their ability to raise their child. Conversely, the association with negative affectivity temperament suggests that infants who are fussier and harder to soothe may make it more challenging for mothers to feel confident about their ability to complete routine parenting tasks.

Turning now to correlates of domain-general PSE, as measured by the BAM-13, again in terms of findings with at least small effect sizes (0.20 or higher), regardless of statistical significance, only one correlation met that criterion. Higher social support was associated with higher domain-general PSE. Previous research has shown that strong support networks can alleviate the stress of life hardships. Similarly, perceived social support from mothers' friends, family, and partners may ease the stress associated with caring for an infant, thereby helping mothers to feel more confident about being a parent. The continued support for social support as an important factor in remaining resilient against stressors emphasizes the necessity for new mothers to have others to rely on throughout the early stages of new motherhood.

The current study is the first to examine how changes in mood directly influence PSE by employing an experimental mood manipulation using music and videos. Thus, our findings add important knowledge to the literature that has been limited to correlational support for mood being associated with PSE. Mothers reported significantly lower task-specific PSE, but not domain-general PSE, when feeling sad. This finding is important for a number of reasons. It highlights that sad mood does not affect both aspects of PSE in the same way. This result shows

that task-specific PSE is more sensitive to changes in mood than general feelings about motherhood. Further, the parenting aspect of task-specific PSE also significantly decreased when mothers were sad. This highlights that task-specific PSE, apart from the social support and child development factors of the KPCS, is specifically influenced by mood. Thus, it is clear that parenting confidence in completing daily tasks, such as settling the baby, handling a minor cold, establishing a sleep routine, and playing with the baby, decreases when mothers are sad. When feeling sad, mothers may not feel as up to completing tedious parenting tasks, which may be contributing to the decreased PSE reports. The prospect of accomplishing caretaking duties may seem daunting when sad, but this does not necessarily mean that one feels unhappy about being a mother in general. When feeling down, mothers should take extra care to notice how they are feeling about completing their parenting tasks and, if feeling less confident, to note that this feeling may be due to their mood rather than their ability to parent.

Due to the saliency of the sad video, the participants entered the mastery experience segment significantly sadder than compared to baseline even after a second neutral mood induction. This resulted in the unexpected effect of the mothers starting out their recall and written description of a mastery experience while relatively sad and unhappy. After recalling the mastery experience, mothers' mood significantly improved as shown through self-reported increases in happiness and calmness and decreases in sadness. Most importantly, in terms of our hypotheses, they reported lower task-specific PSE, but there was no significant difference in domain-general PSE scores. This finding suggests that recalling a challenging parenting experience when feeling sad may actually have an adverse effect on a mother's task-specific PSE but, ultimately helps to improve general mood. The reminder of the upsetting experience, even though it was overcome, may have negative impacts on one's confidence beliefs about their

ability to handle parenting tasks. However, the finding that the mastery experience did not significantly change mother's domain-general PSE suggests that one's feelings towards motherhood may be more fixed that one's confidence in specific parenting tasks.

Despite mothers beginning the mastery experience sadder than after the first neutral mood induction, these results provides valuable information about PSE nonetheless. We now know that mastery experiences do not raise PSE when mothers are already feeling down and therefore should not be used in that context. Instead, it is still of interest for future research to examine whether mastery experiences can raise PSE levels when mothers are not sad, but rather are in a neutral mood. Future research should also further explore if domain-general PSE is less sensitive to change than task-specific PSE.

One of the limitations of this study was that both the KPCS and the SCCE had low internal reliability. This may pose a challenge for future replications of this study. However, this result also emphasizes the need for future researchers to develop a more reliable and valid measure of prior experience with children. Additionally, another limitation of the study is the correlational and cross-sectional study design. This prevents us from being able to establish causality between the correlates and the PSE scores. Future research could build upon this research by analyzing differences in task-specific PSE before and after an intervention which increases mothers' knowledge of child development. It would also be of interest to conduct a longitudinal design which tracks changes in parenting self-efficacy throughout pregnancy, the perinatal period, and up to the first birthday. This design would allow researchers to analyze how PSE changes as new mothers become more experienced with their infant. Lastly, a drawback of this study was that mothers entered the mastery experience in a somewhat sad mood. Because mastery experiences are a foundation of self-efficacy expectations, future research should

continue to explore how and when to use recalling mastery experiences as a technique to change PSE levels.

This study had a number of strengths that expand the current PSE literature. First, we tested a wide variety of potential correlates that were well justified by the literature and yet had not been examined in the published literature. The results yield a new understanding of the constructs that are and are not associated with parenting self-efficacy. Second, first-time mothers of infants have largely not been studied in the existing parenting self-efficacy literature. Thus, this study provided novel understanding of factors that are associated with PSE in this population. Third, we included two measures of PSE, reflecting the two different approaches that researchers take to understanding this construct. Given that we observed different results for the two types of PSE, distinguishing between the two types of PSE in future research is crucial. Although the two measures are strongly related to each other (as shown in Table 2), our research underscores that they measure separate domains of PSE and are uniquely related to different factors. Fourth, as far as we know, this study is the first of its kind to experimentally manipulate mood to directly assess how sad mood affects PSE. This is significant because prior research has primarily focused on the relationship between depression and PSE. However, fluctuations in mood affect all parents and it is important to understand how these fluctuations affect one's parenting self-efficacy. Fifth and finally, the results of the mastery experience segment provide a more in-depth understanding Bandura's self-efficacy theory and how self-reflection of challenging parenting tasks affects PSE. The results of this study can be incorporated in therapeutic interventions intended to raise parenting self-efficacy in new mothers. The present results suggest that such an intervention could include topics on typical child behaviors and milestones, building a social support system, and understanding a child's temperament.

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Table 1
Descriptive Statistics for Self-Efficacy Variables and Hypothesized Correlates (N = 30)

Variable	*M*	*SD*	Range
KPCS	39.39	2.92	33-45
KPCS Parenting Factor	21.70	1.86	18-24
BAM-13	26.14	6.09	15-38
MSPSS	5.78	1.11	2-7
SCCE	6.13	4.33	1-15
KIDI	16.20	2.09	11-20
IBQ-R VSF			
Surgency	4.85	0.72	3.20-6.46
Negativity	4.11	0.93	2.50-5.92
Effortful Control	4.98	0.66	3.91-6.55

KPCS Karitane Parenting Confidence Scale (Črnčec et al. 2008), *BAM-13* Being a Mother (Matthey, 2011), *MSPSS* Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), *SCCE* survey of childcare experiences (MacPhee, 2002), *KIDI* Knowledge of Infant Development Inventory, *IBQ-R VSF* (MacPhee, 2002) Infant Behavior Questionnaire-Revised Very Short Form (Rothbart, 1981).

Table 2
Correlations Among Self-Efficacy Measures and Correlates

	KPCS	BAM-13	MSPSS	SCCE	KIDI	Surgency	Negativity	Effortful Control
KPCS								
BAM-13	.49**							
MSPSS	0.01	.29						
SCCE	-.07	.19	.18					
KIDI	.33	.09	-.10	.31				
Surgency	.41*	.19	-.03	.03	.18			
Negativity	-.20	.04	.02	-.06	-.38*	.12		
Effortful Control	.11	.08	-.15	-.03	.04	.18	-.19	

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

Table 3
Mood Manipulation Paired T-Test Results

	M	*SD*	*t*	Std. Error	Conf. Int.	*p*
Happiness: Neutral Music vs. Sad Video	69.81; 15.50	18.08; 20.48	-12.64(29)	4.33	(-63.59, -45.88)	.00***
Sadness: Neutral Music vs. Sad Video	6.31; 79.13	9.97; 18.49	23.88(29)	3.06	(66.75, 79.25)	.00***
Calmness: Neutral Music vs. Sad Video	57.50; 32.06	27.55; 23.15	-4.54(29)	5.33	(-35.06, -13.27)	.00***
Happiness: Neutral Music vs. Neutral Video	69.81; 52.22	18.08; 26.32	-2.08(29)	0.05	(-17.99, -0.15)	.047*
Sadness: Neutral Music vs. Neutral Video	6.31; 14.19	9.97; 17.06	2.31(29)	3.78	(1.01, 16.46)	.03*
Calmness: Neutral Music vs. Neutral Video	57.50; 62.91	27.55; 23.25	-0.23(29)	6.27	(-14.29, 11.36)	.82
Happiness: Neutral Video vs. Mastery Experience	15.47; 61.13	20.76; 27.03	9.725(29)	4.70	(36.06, 55.27)	.00***
Sadness: Neutral Video vs. Mastery Experience	79.60; 15.33	17.54; 20.31	-15.186(29)	4.23	(-72.92, -55.61)	.00***
Calmness: Neutral Video vs. Mastery Experience	32.90; 55.60	23.65; 27.09	4.243	5.35	(11.76, 33.64)	.00***

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

Table 4
PSE Changes After Sad Mood Induction: Paired T-Test Results

	M	*SD*	*t*	Std. Error	Conf. Int.	*p*	*d*
Total KPCS Score: Neutral Music vs. Sad Video	38.25; 35.68	3.11; 5.96	-2.80(29)	0.92	(-4.43, -0.69)	.009**	-0.51
KPCS Parenting Factor: Neutral Music vs. Sad Video	20.87; 19.48	2.20; 3.74	-2.51(29)	0.55	(-2.52, -0.26)	0.02*	-0.46
BAM-13: Neutral Music vs. Sad Video	26.71; 25.74	5.95; 7.62	-1.41(29)	0.69	(-2.39, 0.44)	0.17	-0.26

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

Table 5
PSE Changes After Mastery Experience (ME): Paired T-Test Results

	M	*SD*	*t*	Std. Error	Conf. Int.	*p*	*d*
Total KPCS: Neutral Music vs. ME	38.25; 30.13	3.11; 2.59	-10.54(28)	0.76	(-9.53, -6.43)	.00***	-1.92
KPCS Parenting Factor: Neutral Music vs. ME	20.87; 17.52	2.20; 1.68	-7.06(29)	0.47	(-4.32, -2.38)	.00***	-1.29
BAM-13: Neutral Music vs. ME	26.71; 27.88	5.95; 6.15	-1.45(29)	0.81	(-2.83, 0.49)	.16	-0.26

***$p < 0.001$