

Using Baby Books to Increase New Mothers' Self-Efficacy and Improve Toddler Language Development

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Maternal self-efficacy (MSE) has been shown to be important, yet little is known about how it develops over time and whether increasing knowledge about child development and parenting results in feeling more efficacious, especially for first-time mothers. Furthermore, research is lacking about whether increased maternal self-efficacy results in better child outcomes such as more receptive and expressive language. Using a randomized three-group design, this study explores whether educational books, embedded with information about typical child development and optimal parenting, increase MSE for women over the first year and a half of motherhood and whether these increases result in better language skills for children at 18 months of age. Hierarchical linear model analyses show that MSE starts high and remains high and that providing educational books further increases the development of MSE. Increases in MSE have a positive impact on children's language skills, as does providing books, irrespective of educational content. These findings support the importance of MSE and demonstrate an inexpensive way to increase MSE and improve child outcomes. Copyright © 2013 John Wiley & Sons, Ltd.

Key words: maternal self-efficacy; baby books; reading; language development

Mothers play a crucial role in children's development and how they feel about their ability to be a good mother can affect their parenting (Bandura, 1997). Maternal self-efficacy (MSE), a mother's sense of her ability to parent, influences her engagement, warmth and responsiveness to her child and her effectiveness as a parent. Mothers gain a sense of efficacy with experience and knowledge about child development (Coleman & Karraker, 2000, 2003). Therefore, it is reasonable to question if increases in knowledge about child development would increase new mothers' sense of efficacy for parenting and whether increases in efficacy would improve child outcomes. Using a three-group randomized design, this study explores whether baby books, embedded with

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educational information about child development and parenting, influence first-time mothers' MSE over time and if increases result in improved toddler language skills.

Maternal Self-efficacy and its Development

Self-efficacy is one's belief in his/her ability to perform a specific task (Bandura, 1986). Applied to parenting, MSE involves a mother's belief that she can positively meet the needs of her child (Coleman & Karraker, 2000, 2003), which is influenced by knowledge, psychological states and verbal persuasion from others (Bandura, 1986). Since knowledge is foundational for feeling efficacious, increases in maternal knowledge should increase feelings of self-efficacy for mothers. Further, one's performance on various parenting tasks impacts maternal self-efficacy (Bandura, 1986, 1997; Froman & Owen, 1989; Porter & Hsu, 2003), yet most research on the development of MSE fails to distinguish first-time mothers from those with multiple children. Since new mothers lack parenting experience, it is important to differentiate the development of MSE for new versus experienced mothers.

Research suggests that MSE varies with different aged children, where the older the child the higher the MSE (Coleman & Karraker, 2000; Pierce et al., 2010). This may be due to continual feedback while parenting, which provides opportunities to improve and feel more efficacious. Thus far, methodological designs limit our understanding of how MSE develops over time. For instance, past studies of MSE have typically used cross-sectional designs of mothers with different aged children at one time point (Coleman & Karraker, 2000), two measurements over 3 months (Donovan, Taylor, & Leavitt, 2007) or small, less generalizable samples (Elek, Hudson, & Bouffard, 2003; Gross, Conrad, Fogg, & Worthke, 1994; Hudson, Elek, & Ofe Fleck, 2001). Thus, little is known about how MSE develops and changes over time for the same women, especially those who are new to parenting.

Knowledge and Maternal Self-efficacy

Research suggests that MSE is changeable and that parenting experience and knowledge change MSE over time (Bandura, 1994; Jerusalem & Mittag, 1995). Increases in knowledge can come from direct parenting experiences (e.g. understanding development because it is witnessed in your child) and other sources (e.g. parents' discussions with other parents; Goodnow, 2002). Paediatric anticipatory guidance (i.e. educational information typically provided by paediatricians about children's development and ways to promote health and prevent injury) is another mechanism for learning about child development and parenting (Reich, Bickman, Saville, & Alvarez, 2010; Schuster, Duan, Regalado, & Klein, 2000).

Baby Books for Educating Parents

Given that knowledge about parenting influences feelings of MSE (Bandura, 1994), it is worthwhile to investigate whether an educational intervention could increase new mothers' feelings of efficacy. To address this, baby books were embedded with educational information about typical child development and optimal parenting behaviours derived from the American Academy of Pediatrics' *Bright Futures Guidelines for Health Supervision* (Hagan, Shaw, & Duncan, 2008). Although these books have been shown to increase maternal knowledge (Reich, Bickman, Saville, & Alvarez, 2010) and alter some parenting beliefs (Reich, Penner,

Duncan, & Auger, 2012) and practices (Reich, Penner & Duncan, 2011), their impact on MSE has yet to be tested. Such an intervention may be especially beneficial for low-income mothers who may have less knowledge about child development than their more affluent peers (Benaisch & Brooks-Gunn, 1996; Reich, 2005)

Research suggests that mothers who are more knowledgeable about child development tend to create appropriate environments for children's emerging abilities (Benaisch & Brooks-Gunn, 1996), such as practise appropriate verbal interactions with their children (Diken & Diken, 2008). Since efficacy leads to better environments, it is quite feasible that increases in MSE could result in better child outcomes.

The Importance of Maternal Self-efficacy for Children's Language Development

Research has found that mothers with higher MSE (Ainsworth, Blehar, Waters, & Wall, 1978; Izzo, Weiss, Shanahan, & Rodriguez-Brown, 2000) and greater responsiveness to their children (Bornstein & Tamis-LeMonda, 1989; Kochanska & Murray, 2000) positively influence their children's development. This is possibly because mothers who feel confident in their ability to parent are more likely to behave in ways that support their children's healthy development (Jones & Prinz, 2005; Levy-Shiff, Dimitrovsky, Shulman, & Har-Even, 1998; Lugo-Gil & Tamis-LeMonda, 2008; Schneewind, 1995). Specifically, they may communicate in a manner that is more appropriate to their children's ability (Diken & Diken, 2008), for example, reading to children and providing more materials, such as books, that encourage language development (Townsend & Choi, 2004). However, research that addresses the relation between early maternal self-efficacy and later language development for typically developing children is absent from the current literature. Further, research has found that efficacious mothers are more responsive to their children, which is positively related to cognitive growth (Landry, Smith, Swank, Assel, & Vellet, 2001; Landry, Smith, & Swank, 2006).

Conversely, mothers who feel less efficacious are less likely to positively engage with their children (Cummings & Davies, 1994; Teti & Gelfand, 1991). For mothers, lower MSE is associated with feelings of depression (Johnson & Sarason, 1978), which is linked to more punitive parenting styles (Sanders & Woolley, 2005) and environments that are less supportive of healthy development (National Research Council, 2009).

The Present Study

This three-group random assignment study explores whether using educational baby books, embedded with information about typical child development and optimal parenting derived from the American Academy of Pediatrics' *Bright Futures Guidelines for Health Supervision* (Hagan et al., 2008), could increase new mothers' feelings of efficacy in parenting over the first 18 months of motherhood. We hypothesized that MSE would increase as mothers gain experience with their infants and that mothers who receive educational information would increase their MSE at a faster rate than mothers who did not. Additionally, we expect that higher levels and steeper rates of change in MSE would promote children's language development at 18 months.

METHOD

To test the impact of educational baby books on MSE, women who were pregnant with their first child were recruited during the third trimester of pregnancy from obstetrician resident continuity clinics in a southern state. Participants, after completing baseline data, were randomly assigned to one of three groups. The educational intervention group (i.e. educational book group) was given six baby books embedded with educational material corresponding to the paediatric anticipatory guidance typically provided during well-child visits over the first year (newborn, 2, 4, 6, 9 and 12 months). The non-educational comparison group (i.e. non-educational book group) was given visually identical baby books on the same schedule, but these books had rhymes related to the pictures rather than educational information. The control group (i.e. no book control group) did not receive any books. Each book was written at a first grade reading level (see Figure 1 for sample pages).

For all three groups, mothers were told that reading was important and encouraged to read to their baby. A trained researcher, blind to experimental condition, visited participants' homes when they were pregnant (baseline) and at 2, 4, 6, 9, 12 and 18 months postpartum. Due to participants' scheduling conflicts, home-based data collection occurred within a 12-day window (6 days before or after the infant's targeted age). Children's language development was assessed at 18 months. Researcher contact with participants was equivalent across all three groups and two university Institutional Review Boards approved all procedures.

Participants

Participants were recruited from the waiting room of their obstetricians' clinic, and only those expecting their first child and who were able to read at a first grade reading level were eligible for the study. Of the 198 mothers who completed baseline data (while pregnant), 167 participated in post-random assignment data collection.

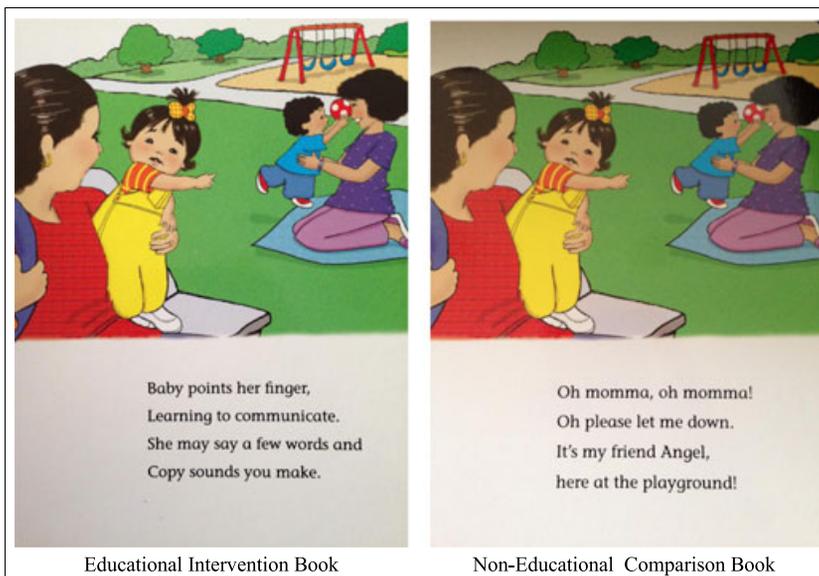


Figure 1. Sample pages from the educational and non-educational books at 12 months.

Reasons for attrition from baseline to post-random assignment data collection (2 months postpartum) included foetal demise ($n=4$), moving away ($n=2$), lack of interest ($n=14$) and inability to contact ($n=11$). From the 167 women who completed post-random assignment data collection, 32 missed at least one data collection wave. Of these, 22 dropped out of the study before their child was 18 months, and 10 missed at least one wave but did not discontinue participation. Comparisons between those with complete data or not (i.e. assessment for differential attrition) found only two differences out of 28 comparisons. First, those with missing data were less likely to report reading to their foetus during pregnancy. Second, mothers with incomplete data were slightly younger than those with complete data. For this paper, all participants with any post-random assignment data ($n=167$) are included in the analysis.

At baseline (pregnancy), all women were between 18–40 years of age ($M=23$ years; $SD=4.57$). Their educational background varied, with the majority having no more than a high school diploma or equivalent. Most were African American (63%), 20% were married/living as married and 80% of the pregnancies were unplanned. See Table 1 for details.

Measures

Background information

During the initial home visit (pregnancy), women were asked about their social (e.g. feelings about pregnancy, substance use), fiscal (e.g. income, public assistance benefits) and demographic (e.g. age, marital status) background.

Maternal self-efficacy

Maternal self-efficacy was assessed using the 10-item self-report Maternal Self-Efficacy Scale (Teti & Gelfand, 1991) designed for mothers of infants and toddlers. Mothers were asked to rate how good they are at various childcare activities (four-point scale: 0 = 'not at all' to 3 = 'very good'). Nine items refer to specific behaviours (e.g. feeding, bathing and soothing) and the last item is a global evaluation of mothering ability (How good are you at understanding what your baby wants or needs?; 0 = 'I do not understand my baby' to 3 = 'I understand my baby all of the time'), therefore, total scores could range from 0 to 30. Creators of this instrument report good reliability ($\alpha=0.79-0.86$) and concurrent validity ($r=0.75$) with the Parenting Sense of Competence scale (Teti & Gelfand, 1991). The instrument has been used with similar low-income and ethnically diverse samples (Jackson, 2000).

Language development

Toddler language development was measured at 18 months using the Preschool Language Scale-fourth edition (PLS4; Zimmerman & Casteleja, 2005). This norm-referenced observational measure of children's (ages 0–7) receptive and expressive language is commonly used with similar populations (Horton-Ikard & Weisner, 2007). The instrument yields receptive and expressive subscales and a combined total language score. Creators of this instrument report high reliability (test-retest ranges from 0.82 to 0.95 and $\alpha=0.81-0.96$; Zimmerman, Steiner, & Pond, 2009). All children were assessed with this observational tool in their homes by a trained researcher, blind to experimental condition, while the mother was present. See Table 2 for details.

Table 1. Participant characteristics

	All mothers		Educational intervention	Non-educational comparison	No book control	Test statistic
	<i>n</i>	%	<i>N</i> %	<i>N</i> %	<i>N</i> %	
Education						$X^2 = 96, p = 0.14$
Some high school	42	25	25	32	19	
Completed high school	51	31	26	27	38	
Some college	49	29	36	32	21	
College or above	25	15	13	9	22	
Ethnicity						$X^2 = 26, p = 0.27$
African American, non-Hisp	105	63	68	63	53	
Other	62	37	32	37	47	
Income						$X^2 = 96, p = 0.36$
Less than \$8,000	25	14	23	13	10	
\$8,001–\$12,000	20	12	15	9	12	
\$12,001–\$16,000	11	7	8	11	2	
\$16,001–\$21,000	11	7	4	9	7	
\$21,001–\$26,000	11	7	9	4	7	
\$26,001–\$30,000	4	2	4	2	2	
\$30,001–\$40,000	8	5	4	5	5	
\$40,001–\$50,000	4	2	4	0	3	
\$50,001–above	11	7	4	4	12	
Missing	62	37	25	43	40	
Marital status						$X^2 = 25, p = 0.29$
Single or other	134	80	81	86	74	
Married or living as married	33	20	19	14	26	
Planned Pregnancy						$X^2 = 58, p = 0.05^*$
Planned pregnancy	33	20	11	18	29	
Non planned pregnancy	134	80	89	82	71	
Read Book at						
Least Once						
2-Months	15	33	33	n/a	n/a	
4-Months	90	93	89	96	n/a	$X^2 = 1.9, p = 0.17$
6-Months	79	86	76	96	n/a	$X^2 = 7.3, p = 0.00^*$
9-Months	85	89	87	92	n/a	$X^2 = 0.60, p = 0.44$
12-Months	85	89	87	92	n/a	$X^2 = 0.60, p = 0.44$
			Mean (SD)	Mean (SD)	Mean (SD)	
Maternal age			23.1 (5.0)	22.5 (4.4)	23.5(4.4)	$F = 62, p = 0.54$

Chi-squared test and Kruskal-Wallis tests were used to test differences between group memberships.

Implementation

To ensure that both types of books were read, women in the two book groups (educational and non-educational) were asked to report how often they read the books that were given to them in the days preceding the home data collection visit. They were also asked to read the book aloud when the researcher visited their home. For the no book control group, women read a

Table 2. Means and standard deviation of maternal self-efficacy by wave and child outcomes

	Age of Child (months)	Range	Educational intervention		Non-educational comparison		No book control	
			Mean	SD	Mean	SD	Mean	SD
Maternal self-efficacy	2	15–30	23.43	3.22	24.72	2.91	24.80	2.93
	4	13–30	24.62	3.51	25.35	3.17	24.62	3.04
	9	12–30	24.26	3.52	24.65	3.30	23.98	3.00
	12	13–30	24.53	2.91	25.36	2.65	24.53	2.91
	18	13–30	25.09	3.33	25.17	3.41	24.74	2.84
Child outcomes								
Language total	18	17–46	34.43	4.52	34.72	4.56	33.56	4.40
Expressive language	18	4–25	17.19	3.26	17.53	3.05	16.50	3.16
Receptive language	18	13–26	17.24	1.92	17.20	1.75	17.06	1.71

SD, standard deviation.

Raw scores are presented for maternal self-efficacy and child outcomes.

commercially available book that the researchers brought with them. See Table 1 for details.

Analysis

Assessing group characteristics after random assignment, analyses for baseline equivalence across groups found no differences except that significantly more pregnancies were planned in the no book control (29%) than the educational intervention (11%) and non-educational comparison (18%) groups ($X^2 = 58$, $p = 0.05$). See Table 1 for details.

Question 1: How Does MSE Develop for New Mothers?

Growth curve analyses were conducted to describe patterns of change in MSE over time. Hierarchical Linear Modeling (HLM) is a multilevel analysis technique that explains variance in individual (within-subjects) growth trajectories (level 1) and determines the proportion of variance of the intercepts and slopes explained by between-subjects factors (level 2) (Raudenbush & Bryk, 2002). For this study, repeated measures over time (level 1) are nested within people (level 2), allowing for comparisons of individual growth trajectories in relation to a grand mean growth curve and how person-level characteristics predict differences in these curves (Rogosa, Brandt, & Zimowski, 1982).

Intercepts were estimated by centering at 2 months to describe the level of MSE at the first postnatal wave. Slopes, which are the rate of change in MSE over time, were conducted to explore how MSE develops over the first 18 months of motherhood. HLM uses maximum likelihood methods by pulling the individual and sample data to estimate the level of MSE for participants missing data at any time point, allowing for the inclusion of women without complete data. To control for differences in participants, maternal education, age, ethnicity (Black, non-Hispanic or other), income, marital status (married/living as married or other) and planned pregnancy were used as covariates in the model. To control for variation in child age within and

across each assessment point, a cubic function of child's age was included in all regression analyses. All covariates were mean centred. Time was divided in months since the child's birth and was centred at 2 months. Months postpartum and months squared were included to allow for assessment of the pattern of change over time.

Question 2: What Impact Does an Educational Intervention Have on MSE?

In order to test whether providing educational information to new mothers altered the development of MSE, between-group comparisons (educational intervention, non-educational comparison, no book control groups) were entered into the HLM regressions. The same covariates as listed above were included, and both intercept and slope in MSE were the key dependent variables.

Question 3: Do Changes in MSE Impact Toddlers' Language?

Using the slopes (rate of change in MSE) and intercepts (initial MSE level) from the HLM analyses described above, a series of Ordinary Least Square (OLS) regressions were conducted to test the (i) effect of patterns of change in MSE (intercept, slope) on children's language skills at 18 months and (ii) whether there were differing effects by group assignment. Covariates were the same as the previous two questions.

RESULTS

Questions 1 and 2: How Does MSE Develop and What Impact Does an Educational Intervention Have on MSE?

Across all three groups, MSE started relatively high (at 2 months) and remained high (18 months) as shown in table 2. Aggregating all three groups, there were no significant differences in the 2-month and 18-month MSE scores across the three groups. However, when considering group assignment, the rate of change in MSE did differ. Although all three groups had a positive linear rate of change, mothers in the educational intervention group had a significantly steeper rate of change when compared with mothers in the non-educational comparison ($\beta=0.10$, $p=0.046$) and no book control ($\beta=0.16$, $p=0.001$) groups. The rate of change in MSE in the non-educational comparison group was slower than the no book control group ($\beta=-0.10$, $p=0.046$) (see Table 3 for details).

Question 3: Do Changes in MSE Impact Children's Language Development?

Maternal self-efficacy and language

Overall, MSE predicted children's language skills. MSE at 2 months (intercept) was related to children's expressive language ($\beta=0.21$, $p=0.001$), receptive language skills ($\beta=0.34$, $p<0.001$) and total language skills ($\beta=0.30$, $p<0.001$) at 18 months. OLS regression analyses of change in MSE across groups reveal that the rate of change (i.e. slope) was not associated with children's expressive language skills at 18 months but that mothers with steeper change (slope) in MSE have children with higher receptive language skills at 18 months ($\beta=0.17$, $p=0.012$). OLS regression analyses of change in MSE across mothers on total language (combined expressive and receptive language scores) found no significant differences (see Table 4 for details).

Table 3. Maternal self-efficacy: individual growth curves and group trajectory

Fixed-effect parameter estimates	β	SE
Intercept (maternal self-efficacy at 2 months)		
Educational intervention versus non-educational comparison	-1.39	0.84
Educational intervention versus no book control	-1.65	0.89
Non-educational comparison versus no book control	1.65	0.89
Slope		
Educational intervention versus non-educational comparison	0.16***	0.05
Educational intervention versus no book control	0.10*	0.05
Non-educational comparison versus no book control	-0.10*	0.05
Random-effects parameter estimates	Variance	SE
Var(intercept)	5.37*	1.19
Var(slope)	0.001*	0.00
Cov(int, slope)	-0.01	0.05
Residual	3.78*	0.33

SE, standard error.

Covariates include maternal education, maternal age, ethnicity, marital status, income and planned pregnancy.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Intervention impacts on maternal self-efficacy and language

There was some evidence that group assignment impacted the relationship between MSE and language. When comparing the educational intervention group to the no book control group, there was a positive effect of providing educational books on children's expressive language ($\beta = 0.19$, $p = 0.001$) and total language ($\beta = 0.17$, $p = 0.01$). However, there was a negative impact on expressive language when comparing the educational intervention group to the non-educational comparison group ($\beta = -0.15$, $p = 0.007$), but no difference on receptive and total language. When considering the book groups together, children of mothers in these groups had higher total language skills than children in the no book control group

Table 4. Regressions: maternal self-efficacy growth curve parameters as predictors of expressive, receptive and total language skills

Curve parameter	PLS expressive language		PLS receptive language		PLS total language	
	β	SE	β	SE	β	SE
Slope (change in maternal self-efficacy)	0.05	19.18	0.17**	11.18	0.11	26.29
Intercept (maternal self-efficacy at 2 months)	0.21 ***	0.09	0.34***	0.05	0.30***	0.12
Group						
Educational intervention versus non-educational comparison	-0.15**	0.39	0.05	0.23	-0.09	0.54
Educational intervention versus no book control	0.19 ***	0.38	0.07	0.22	0.17**	0.53
Non-educational comparison versus no book control	0.16 ***	0.34	0.01	0.20	0.12*	0.47
Model R^2	0.10		0.10		0.10	

PLS, preschool language scale; SE, standard error.

Covariates include maternal education, maternal age, ethnicity, income, marital status and planned pregnancy.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

(educational group $\beta = 0.17$, $p = 0.004$ and non-educational group $\beta = 0.12$, $p = 0.01$), suggesting a benefit of books in general. The non-educational comparison group had a significant positive effect on expressive language skills and total language skills ($\beta = 0.12$, $p = 0.05$) at 18 months compared to the no book control group ($\beta = 0.16$, $p = 0.001$).

DISCUSSION

This study addressed a large gap in the literature by exploring the development of MSE for new mothers during the first 18 months of motherhood, the impact of MSE on children's language skills and whether an educational intervention could improve the development of MSE and subsequently children's language. Results show that for these first-time mothers, MSE starts high and remains high, indicating that they do feel prepared for motherhood. Although previous studies have included predominately White, college educated and married samples, the average MSE scores from the present study are on the lower end of the range of previously reported MSE scores (e.g. Leerkes & Crockerberg, 2002; Teti & Gelfand, 1991). However, providing educational books increased the rate of change in MSE during the first 18 months. Although a small effect, this is meaningful since research supports the benefit of MSE for mothers and children (Ainsworth et al., 1978; Diken & Diken, 2008; Izzo et al., 2000; Jones & Prinz, 2005). These findings are particularly interesting given that previous studies have not investigated the development of first-time mothers' MSE beyond 3 months. In addition, these findings are promising given that low-income, minority, unmarried/un-partnered and less-educated women have been shown to have lower levels of self-efficacy and increased levels of parenting stress (Jackson, 2000; Jackson & Scheines, 2003; Jones & Prinz, 2005).

In looking at how changes in MSE impact children's language development, increases in MSE predicted children's better receptive language skills at 18 months. One possible explanation is that as women feel more efficacious about parenting, they talk more with their children (Townsend & Choi, 2004). The lack of impact on expressive language may be a limitation of the timing of the measurement. Since 18-month-old children have a much larger receptive than expressive vocabulary, the measurement of receptive language is more sensitive than expressive language. Further, higher levels of MSE for all mothers at 2 months were associated with toddlers' increased receptive, expressive and total language skills at 18 months; a finding that has yet to be explored in the current literature. Other research on the impact of MSE on parenting and child behaviours have found that how efficacious mothers feel about their ability to parent predicts infant crying and fussiness (Bolton, Fink, & Stadler, 2012) and mothers' choices of discipline use (Sanders & Woolley, 2005). The finding that MSE also influences language skills builds on these studies and is supported by additional research findings that more efficacious mothers talk more with their children, read to them and provide more books (Townsend & Choi, 2004).

Although 2-month MSE levels and the rate of change in self-efficacy were predictive of children's language development, the impact of the intervention on language was less clear. Both book groups had higher language scores than the no book control group suggesting that providing books, irrespective of content, is beneficial for language development. This aligns with other studies finding that book exposure and reading are predictive of literacy skills, school readiness and elementary school performance (Bus, van IJzendoorn, & Pellegrini, 1995; Bennett, Weigel,

& Martin, 2002; Rodriguez & Tamis-LeMonda, 2011; Sénéchal & LeFevre, 2002). Thus, the discovery that providing books can promote language skills as early as 18 months is quite promising.

Although the impacts of the rate of change in MSE due to the intervention were not a clear contributor to children's language skills, the finding could still be important since MSE is associated with other maternal outcomes such as depression (Cultrona & Troutman, 1986; Holland et al., 2011), stress (Bolton et al., 2012) and parenting behaviours (Coleman & Karriaker, 1998). Perhaps feeling better about parenting sooner (i.e. steeper rate of change in MSE) could protect against these types of negative practices and lead to more positive behaviours such as communicating appropriately (Diken & Diken, 2008) and providing more reading materials (Townsend & Choi, 2004), which support positive language development. Given that this process has yet to be investigated, this study is a first step. Future work should consider the impact of the development of MSE (slope) over time on these maternal outcomes and behaviours.

This study's finding that books promote toddler language and educational books increase MSE is exciting given that a book intervention is easy to implement. For instance, educational books could be given to parents during paediatric visits, added to community programmes like Reach Out and Read (Mendelsohn et al., 2001) or even mailed directly to families. Furthermore, providing books can promote reading and encourage parent-child interactions (Needlman & Silverstein, 2004).

Limitations

The present study is not without limitations. Prenatal MSE was not measured, limiting our understanding of MSE before women become mothers and how their MSE may change after becoming a mother. The sample size was relatively small, providing less power to detect small effects. However, repeated measures in the data did provide some additional sensitivity. Mothers' linguistic behaviours (e.g. reading, talking) with their children were not measured. Future work should explore how MSE connects to parenting behaviours, especially around communicating with the child. This sample was predominantly African American, low-income and unmarried, limiting generalizations to other populations (e.g. higher income, multiparous women and fathers). Finally, only toddler language skills were measured. Nevertheless, MSE could impact other child outcomes such as physical health, cognitive development and emotional regulation. Future studies should explore how MSE influences child development in other domains.

Implications

These results suggest that educational information in baby books can increase mothers' feelings of efficacy for mothering. While increases in MSE have positive impacts on toddlers' language skills, so do the provision of books in general (educational or non-educational). Future work should disentangle the impact of reading from educational reading and how they relate to MSE. These findings suggest that interventions to increase toddlers' language skills should include efforts to provide free books and that providing educational baby books is one low-cost method for improving MSE.

REFERENCES

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: a psychological study of the Strange Situation*. Hillsdale, NJ: Erlbaum.
- Bandura, A. (1986). *Social foundations of thought & action: A social cognitive theory*. England Cliffs, NJ: Prentice-Hall, Inc.
- Bandura, A. (1994). Self-efficacy. In V. S. Ramachandran (Ed.), *Encyclopedia of human behavior* (Vol. 4, 71–81). New York: Academic Press.
- Bandura, A. (1997). *Self-Efficacy: the exercise of control*. New York: W. H. Freeman and Company.
- Benaisch, A. A., & Brooks-Gunn, J. (1996). Maternal attitudes and knowledge of child-rearing: associations with family and child outcomes. *Child Development, 67*(3), 1189–1205. doi: 10.1111/j.1467-8624.1996.tb01790.x
- Bennett, K. K., Weigel, D.J. & Martin, S.S. (2002). Children's acquisition of early literacy skills: examining family contributions. *Early Childhood Research Quarterly, 17*, 295–317. doi: 10.1016/S0885-2006(02)00166-7
- Bolton, M. I., Fink, N. S., & Stadler, C. (2012). Maternal self-efficacy reduces the impact of prenatal stress on infant's crying behavior. *The Journal of Pediatrics, 161* (1), 104–109. doi: 10.1016/j.jpeds.2011.12.044
- Bornstein, M. H. & Tamis-LeMonda, C. S. (1989). Maternal responsiveness and cognitive development in children. In M. H. Bornstein (Ed), *New Directions for Child Development* (pp. 49–61), San Francisco: Jossey Bass.
- Bus, A. G., van IJzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: a meta-analysis on intergenerational transmission of literacy. *Review of Educational Research, 65*(1), 1–21. doi: 10.3102/00346543065001001
- Coleman, P. K. & Karraker, K. H. (2000). Parenting self-efficacy among mother of school-aged children: conceptualization, measurement and correlates. *Family Relations, 4*(1), 13–24. doi: 10.1111/j.1741-3729.2000.00013.x
- Coleman, P. K. & Karraker, K. H. (2003). Maternal self-efficacy beliefs, competence in parenting, and toddlers' behavior and developmental status. *Infant Mental Health Journal, 24*, 126–148. doi: 10.1002/imhj.10048
- Coleman, P. K. & Karriaker, K. H. (1998). Self-efficacy and parenting quality: findings and future applications. *Developmental Review, 18*(1), 47–85. doi: 10.1006/drev.1997.0448 DOI:10.1006/drev.1997.0448#doilink
- Cultrona, C. E., & Troutman, B. R. (1986). Social support, infant temperament, and parenting self-efficacy: a mediational model of postpartum depression. *Child Development, 57*(6), 1507–1518. from <http://www.jstor.org/stable/1130428>
- Cummings, E. M., & Davies, P. T. (1994). Maternal depression and child development. *Journal of Child Psychology and Psychiatry, 35*(1), 73–122. doi: 10.1111/j.1469-7610.1994.tb01133.x
- Diken, I. H., & Diken, O. (2008). Turkish mother' verbal interaction practices and self-efficacy beliefs regarding their children with expressive language delay. *International Journal of Special Education, 43*(3), 110–117. Retrieved from: <http://www.eric.ed.gov/PDFS/EJ833687.pdf>
- Donovan, W., Taylor, N., & Leavitt, L. (2007). Maternal self-efficacy, knowledge of infant development, sensory sensitivity, and maternal response during interaction. *Developmental Psychology, 43*(4), 865–876. doi: 10.1037/0012-1649.43.4.865
- Elek, S. M. & Hudson, D. B., & Bouffard, C. (2003). Marital and parenting satisfaction and infant care self-efficacy during the transition to parenthood: the effect of infant sex. *Issues in Comprehensive Pediatric Nursing, 26*(1), 45–57. doi: 10.1080/01460860390183065
- Froman, R. D., & Owen, S. V. (1989). Infant care self-efficacy. *Research and Theory for Nursing Practice, 3*(3), 199–211. Retrieved from: <http://www.ingentaconnect.com/content/springer/rtnp/1989/00000003/00000003/art00005>
- Goodnow, J. J. (2002). Cognitive aspects of parenting: parents' knowledge and experience. In M. Bornstein (Ed.), *Handbook of Parenting* (Vol. 3, pp. 439–460). New Jersey: Lawrence Erlbaum Associates.

- Gross, D., Conrad, B., Fogg, L., & Worthke, W. (1994). A longitudinal model of maternal self-efficacy, depression, and difficult, and temperament during toddlerhood. *Research in Nursing & Health*, 17(3), 207–215. doi: 10.1002/nur.4770170308
- Hagan, J. F., Shaw, J. S., & Duncan, P. M. (2008). *Bright futures: guidelines for health supervision on infants, children, and adolescents* (3rd ed.). Elk Grove Village, IL: American Academy of Pediatrics
- Holland, M. L., Yoo, B. K., Kitzman, H., Chaudron, L., Szilagyi, P. G., & Temkin-Greener, H. (2011). Self-efficacy as a mediator between maternal depression and child hospitalization in low-income urban families. *Maternal and Child Health Journal*, 15(7), 1011–1019. doi: 10.1007/s10995-010-0662-z
- Horton-Ikard, R., & Weismer, S. E. (2007). A preliminary examination of vocabulary and word learning in African American toddlers from middle and low socioeconomic status homes. *American Journal of Speech-Language Pathology*, 16, 381–392. doi:10.1044/1058-0360(2007/041)
- Hudson, D.B., Elek, S. M., & Ofe Fleck, M. (2001). First-time mothers' and fathers' transition to parenthood: infant care self-efficacy, parenting satisfaction and infant sex. *Issues in Comprehensive Pediatric Nursing*, 24, 31–43. doi:10.1080/01460860390183065
- Izzo, C., Weiss, L., Shanahan, T., & Rodriguez-Brown, F. (2000). Parental self-efficacy and social support as predictors of parenting practices and children's socioemotional adjustment in Mexican immigrant families. *Journal of Prevention & Intervention in the Community*, 20(1–2), 197–213. doi: 10.1300/J005v20n01_13
- Jackson, A. P. (2000). Maternal self-efficacy and children's influence on stress and parenting among single Black mothers in poverty. *Journal of Family Issues*, 21(1), 3–16. doi: 10.1177/019251300021001001
- Jackson, A., & Scheines, R. (2003). Single mother's efficacy, parenting in the home environment, and children's development in a two-wave study. Department of Philosophy. Paper 134. Retrieved from: <http://repository.cmu.edu/philosophy/134>
- Jerusalem, M. & Mittag, W. (1995). Self-efficacy in stressful life transitions. In A. Bandura (Ed.), *Self efficacy in changing societies* (177–201), New York, NY: Cambridge University Press.
- Johnson, J. H. & Sarason, I. G. (1978). Life stress, depression and anxiety: internal–external control as a moderator variable. *Journal of Psychosomatic Research*, 22(3), 205–208. doi:10.1016/0022-3999(78)90025-9 DOI:10.1016/0022-3999%2878%2990025-9#doilink
- Jones, T.L. & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: a review. *Clinical Psychology Review*, 25(3), 341–363. doi: 10.1016/j.cpr.2004.12.004 DOI:10.1016/j.cpr.2004.12.004#doilink
- Kochanska, G., & Murray, K. (2000). Mother-child mutually responsive orientation and conscience development: from toddler to early school age. *Child Development*, 71(2), 417–431. doi: 10.1111/1467-8624.00154
- Landry, S. H., Smith, K. E., & Swank, P. R. (2006). Responsive parenting: establishing early foundations for social communication, independent problem-solving skills. *Developmental Psychology*, 42(4), 627–643. doi: 10.1037/0012-1249.42.4.627
- Landry, S. H., Smith, K. E., Swank, P. R., Assel, M. A., Vellet, S. (2001). Does early responsive parenting have a special importance for children's development or is consistency across early childhood necessary. *Developmental Psychology*, 37(3), 387–403. doi: 10.1037//0012-1649.37.3.387
- Leerkes, E. M., & Crockenberg, S. C. (2002). The development of maternal self-efficacy and its impact on maternal behavior. *Infancy*, 3(2), 227–247. doi: 10.1207/S15327078IN0302_7
- Levy-Shiff, R. & Dimitrovsky, L., & Shulman, S., & Har-Even, D. (1998). Cognitive appraisals, coping strategies, and support resources as correlates of parenting and infant development. *Developmental Psychology*, 34(6), 1417–1427. doi: <http://dx.doi.org/10.1037%2F0893-3200.22.2.212> 10.1037/0893-3200.22.2.212
- Lugo-Gil, J., & Tamis-LeMonda, C. S. (2008). Family resources and parenting quality: Links to children's cognitive development across the first 3 years. *Child development*, 79(4), 1065–1085. doi: 10.1111/j.1467-8624.2008.01176.x
- Mendelsohn, A. L., Mogilner, L. N., Dreyer, B. P., Forman, J. A., Weinstein, S. C., Broderick, M., Cheng, K. J., Magloire, T., Moore, T., & Napier, C. (2001). The impact of a clinic-based literacy intervention on language development in inner-city preschool children. *Pediatrics*, 107(1), 130–134.

- National Research Council (2009). *Depression in parents, parenting, and children: opportunities to improve identification and treatment and prevention*. Washington, D.C.: The National Academies Press.
- Needlman, R., & Silverstein, M. (2004). Pediatric interventions to support reading aloud: How good is the evidence?. *Developmental and Behavioral Pediatrics, 25*(5), 352–363.
- Pierce, T., Boivin, M., Frenette, E., Forget-Dubois, N., Dionne, G., & Tremblay, R. E. (2010). Maternal self-efficacy and hostile-reactive parenting from infancy to toddlerhood. *Infant Behavior and Development, 33*(2), 149–158. doi: 10.1016/j.infbeh.2009.12.005
- Porter, C.L., & Hsu, H. (2003). First-time mother's perceptions of efficacy during the transition to motherhood: links to infant temperament. *Journal of Family Psychology, 17*(1), 54–64. doi: 10.1037/0893-3200.17.1.54
- Raudenbush, S.W. & Bryk, A.S. (2002). *Hierarchical linear models* (2nd Ed.). Thousand Oaks: Sage Publications.
- Reich, S.M. (2005). What do mothers know? Maternal knowledge of child development. *Infant Mental Health Journal, 26*(2), 143–156. doi: 10.1002/imhj.20038
- Reich, S.M., Bickman, L. Saville, B., & Alvarez, J. (2010). The effectiveness of baby books for providing pediatric anticipatory guidance to new mothers. *Pediatrics, 125*(5), 997–1002. doi: 10.1542/peds.2009-2728
- Reich, S. M. & Penner, E., & Duncan, G. (2011). Using baby books to increase new mothers' safety practices. *Academic Pediatrics, 11*(1), 34–43. doi: 10.1016/j.acap.2010.12.006
- Reich, S. M. & Penner, E., & Duncan, G., & Auger, A. (2012). Using baby books to change new mothers' attitudes about corporal punishment. *Child Abuse & Neglect, 36*, 108–117. doi: 10.1016/j.chiabu.2011.09.017
- Rodriguez, E., & Tamis-LeMonda, C. S. (2011). Trajectories of the home learning environment across the first five years: Associations with children's Language and Literacy skills at prekindergarten. *Child Development, 82*(4), 1058–1075. doi: 10.1111/j.1467-8624.2011.01612.x
- Rogosa, D., Brandt, D., & Zimowski, M. (1982). A growth curve approach to the measurement of change. *Psychological Bulletin, 92*(3), 726–748. doi: 10.1037/0033-2909.92.3.726
- Sanders, M. R., & Woolley, M. L. (2005). The relationship between maternal self-efficacy and parenting practices: Implications for parent training. *Child-Care, Health & Development, 31*(1), 65–73. doi: 10.1111/j.1365-2214.2005.00487.x
- Schneewind, K. A. (1995). Impact of family processes on control beliefs. In A. Bandura (Ed.), *Self-efficacy in changing societies*. (114–148), New York: Cambridge University Press.
- Schuster, M. A., Duan, N., Regalado, M., & Klein, D. J. (2000). Anticipatory guidance: what information do parents receive? What information do they want? *Archives of Pediatrics & Adolescent Medicine, 154*(12), 1191–1198. Retrieved from: <http://archpedi.ama-assn.org/cgi/reprint/154/12/1191>
- Sénéchal, M. & LeFevre, J.-A. (2002). Parental involvement in the development of children's reading skill: a five-year longitudinal study. *Child Development, 73*(2), 445–460. Retrieved from: <http://onlinelibrary.wiley.com/doi/10.1111/1467-8624.00417/pdf>
- Teti, D. M., & Gelfand, D. M. (1991). Behavioral competence among mothers of infants in the first year: the mediational role of maternal self-efficacy. *Child Development, 62*(5), 918–929. doi: 10.1111/j.1467-8624.1991.tb01580.x
- Townsend, M. & Choi, S. F. (2004). Reading achievement in New Zealand: effects of parental self-efficacy and children's motivation. Education-line. Retrieved on December 4, 2011 from <https://vpn.nacs.uci.edu/+CSCO+ch756767633A2F2F6A6A6A2E79727271662E6-6E702E6878++/educol/documents/00003735.htm>
- Zimmerman, I. L., & Castelleja, N. F. (2005). The role of language scale for infant and preschool assessment. *Developmental Disabilities and Research Review, 11*(3), 238–246. doi: 10.1002/mrdd.20078
- Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2009). *Preschool language scale* (4th Ed.). Pearson Education, Inc. Retrieved from http://www.pearsonassessments.com/NR/rdonlyres/6269B9FA-1CCF-4DF8-9F8B-282863589C25/0/PLS4_TechReport.pdf