# Promoting parent academic expectations predicts improved school outcomes for low-income children entering kindergarten☆

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## ABSTRACT

This study explored patterns of change in the REDI (Research-based Developmentally Informed) Parent program (REDI-P), designed to help parents support child learning at the transition into kindergarten. Participants were 200 prekindergarten children attending Head Start (55% European-American, 26% African American, 19% Latino, 56% male, $M_{age} = 4.45$ years, $SD = 0.29$) and their primary caregivers, who were randomized to a 16-session home-visiting intervention (REDI-P) or a control group. Extending beyond a prior study documenting intervention effects on parenting behaviors and child kindergarten outcomes, this study assessed the impact of REDI-P on parent academic expectations, and then explored the degree to which intervention gains in three areas of parenting (parent-child interactive reading, parent-child conversations, parent academic expectations) predicted child outcomes in kindergarten (controlling for baseline values and a set of child and family characteristics). Results showed that REDI-P promoted significant gains in parent academic expectations, which in turn mediated intervention gains in child emergent literacy skills and self-directed learning. Results suggest a need to attend to the beliefs parents hold about their child's academic potential, as well as their behavioral support for child learning, when designing interventions to enhance the school success of children in low-income families.

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## 1. Introduction

Children from socioeconomically-disadvantaged families are particularly likely to start school with inadequate readiness for the academic and behavioral demands (Rimm-Kaufman, Pianta, & Cox, 2000), setting them on a trajectory of underachievement associated with poor educational and behavioral outcomes (Ryan, Fauth, & Brooks-Gunn, 2006). High-quality preschool programs, such as Head Start, significantly boost school readiness skills in preschool, but positive effects typically dissipate at the transition into elementary school (Administration for Children and Families, 2010).

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Recently, the REDI (Research-based Developmentally Informed) Parent program (REDI-P) demonstrated that providing Head Start parents with home learning materials and support at the elementary school transition improved child outcomes in areas of kindergarten literacy skills, $d = 0.25$; teacher-rated academic performance, $d = 0.28$; self-directed learning, $d = 0.29$; and social competence, $d = 0.28$ (Bierman, Welsh, Heinrichs, Nix, & Mathis, 2015). The present study examined the impact of REDI-P on the beliefs parents had about their children's future academic potential (their academic expectations) and explored the degree to which gains in those expectations and other key parenting behaviors mediated intervention effects on child outcomes.

### 1.1. Promoting parent support for learning to enhance kindergarten adaptation

REDI-P was designed to supplement an existing classroom version of the same intervention (Head Start REDI; Bierman et al., 2008). In the classroom, the REDI program included four components. Teachers implemented the Preschool PATHS curriculum (Domitrovich, Cortes, & Greenberg, 2007), which included classroom lessons and activities designed to promote child social-emotional skills (e.g., prosocial behavior, emotional understanding, self-regulation, social problem-solving skills). Teachers also delivered three other components – an interactive reading program aligned with the PATHS themes, a sound games program, and print center activities – in order to boost language and emergent literacy skills (e.g., vocabulary, phonological awareness, print awareness; see Bierman et al., 2008 for more details).

REDI-P was designed to target the same skill domains during home visits. To support language and literacy skill development, parents were provided with a variety of parent-child games and activities designed to foster emergent literacy skills. Several prior studies suggest that parents can boost child letter knowledge, phonemic awareness, and reading readiness by using these types of games and learning activities at home (Ford, McDougall, & Evans, 2009; Haney & Hill, 2004; Jordan, Snow, & Porche, 2000). In addition, home visitors coached parents in interactive reading strategies, showing them how to ask questions and talk with children about the story characters and story events during parent-child reading sessions (e.g., Justice & Ezell, 2000; Mol, Bus, de Jong, & Smeets, 2008). A meta-analysis by Mol et al. (2008) found that interactive reading interventions promoted gains in measures of children's expressive and receptive vocabulary ($d = 0.59$ and $0.22$, respectively), and additional studies suggested that coaching parents to use interactive reading strategies enhanced the effects of classroom reading interventions (Anthony, Williams, Zhang, Landry, & Dunkelberger, 2014; Jordan et al., 2000). REDI-P also encouraged parent-child conversations, by providing games with embedded questions, and by providing ideas for interactive dramatic play (Madden, O'Hara, & Levenstein, 1984). The focus on increasing high-quality parent-child conversations was based on research demonstrating the importance of parent-child conversations to language development (Zimmerman et al., 2009), and evidence that parent use of open-ended questions promotes academic school readiness (Cristofaro & Tamis-LeMonda, 2012). In order to support child social-emotional learning, the content of REDI-P stories and parent-child activities featured the characters and social-emotional skills introduced in the Preschool PATHS Curriculum at school, emphasizing cooperation, caring, compliments, emotional understanding, and self-control (Domitrovich et al., 2007). REDI-P provided books with embedded questions that helped parents discuss feeling words and social lessons within the stories, and also included feeling card games and compliment cards drawn from the classroom PATHS Curriculum for parents to use at home with their children (for more details, see Bierman et al., 2015).

Prior analyses demonstrated that REDI-P was successful in promoting increases in parent's use of interactive reading strategies, $d = 0.28$, and the frequency and length of parent-child conversations, $d = 0.27$, based on parent report (Bierman et al., 2015). This study expanded on those findings in two important ways. First, this study examined whether the REDI-P intervention also had a significant impact on parent academic expectations for their children. Second, this study examined the degree to which intervention-produced changes in parenting behaviors or parent academic expectations mediated intervention effects on child outcomes in kindergarten, controlling for child baseline skills.

### 1.2. Why study parent academic expectations as well as parenting behaviors?

REDI-P was similar to other parenting programs designed to promote child school readiness in that it coached parents to engage in parenting behaviors that are correlated with positive child cognitive and social-emotional development, such as interactive reading, rich language use, and positive interpersonal support (see reviews by Reese, Sparks, & Leyva, 2010; Welsh, Bierman, & Mathis, 2014). However, from a conceptual standpoint, inextricably tied to parent language use and teaching behaviors are the underlying beliefs, emotions, attitudes, and motivations that compel and modulate parent efforts to promote their children's school readiness (Jones & Prinz, 2005). Indeed, longitudinal studies suggest that parent beliefs about their child's future academic and career success are significant predictors of subsequent child academic performance (Davis-Kean, 2005). Furthermore, emerging evidence suggests that parent academic expectations make unique contributions to children's school readiness and academic success in ways that are independent from the parent teaching efforts they motivate (Martini & Sénéchal, 2012).

Sy and Schulenberg (2005) found that parent academic expectations at kindergarten entry predicted child reading and math achievement, both concurrently and into first grade. Similarly, Gut, Reimann, and Grob (2013) demonstrated that parent academic expectations at school entry predicted children's grade point averages three years later. Parents with lower incomes and less education typically have lower academic expectations for their children and feel less efficacious in their capacity to help them succeed than do more economically-advantaged parents (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). However, high parent academic expectations for kindergarten children attenuate the link between family socio-economic status [SES] and child academic attainment at sixth grade (De Civita, Pagani, Vitaro, & Tremblay, 2004). As children grow up, this attenuating effect continues, with high parent expectations even buffering children from the effects of low teacher expectations (Benner & Mistry, 2007). Consistent with this research, Sénéchal

and LeFevre (2002) postulated that improving parent academic expectations, in addition to enhancing parent teaching efforts, may be an important strategy to promote child academic school readiness, particularly for children in low SES families.

The REDI-P intervention included several elements that may have boosted parent academic expectations. At the start and mid-point of the intervention, REDI-P included activities to help parents set goals for themselves and their children, and throughout the program, parents used a "memory book" to monitor their success as they worked with their children. Each session began with a reflection activity, in which parents identified gratifying parent-child interactions, and ended with a goal-setting discussion in which parents identified their teaching plans for the coming week. In addition, the program used videotape review and coaching to promote parent feelings of efficacy. Encouraging parents to reflect on their success teaching their children may have enhanced parent confidence regarding their ability to help their children reach future academic goals, thereby promoting more positive academic expectations. However, this outcome was not explored in the initial outcomes study (Bierman et al., 2015). Hence, a key goal of this study was to test the hypothesis that REDI-P improved parent academic expectations, as well as to explore parent behaviors and parent academic expectations as potential mediators of intervention effects on child outcomes.

### 1.3. Exploring mechanisms of change in parent-focused school readiness interventions

In addition to testing outcomes of parent interventions, research is needed to better understand their mechanisms of action. For example, although developmental studies have linked a set of parenting behaviors (e.g., interactive reading, parent-child conversations, home learning activities) with children's school success, few intervention studies have tested whether changes in those parenting behaviors predict improved child outcomes. Of those that have, findings are mixed (see review by Brooks-Gunn & Markman, 2005). For example, in the Mother Home Program, Madden et al. (1984) found no association between improvements in parent language use and child cognitive outcomes. Similarly, in the Healthy Steps program, Caughy, Huang, Miller, and Genevro (2004) found no evidence that improvements in the quality of mother-child interaction mediated the improvements in child behavior problems and attachment security. In contrast, Lunkenheimer et al. (2008) found that increases in parents' positive behavioral support promoted by the Family Check-up were directly linked with increases in child inhibitory control and language development. These mixed findings reflect a need for additional research exploring the associations between parenting changes and child outcomes in early interventions. In addition to determining whether improved parent teaching strategies mediate child outcomes in intervention studies, research is needed to determine whether promoting positive parent academic expectations mediates child outcomes.

### 1.4. The present study

The present study addressed two research questions: (1) did the REDI-P intervention have a significant impact on parent academic expectations for their children? and (2) to what degree did intervention-produced changes in parenting behaviors (parent-child interactive reading, parent-child conversations) or parent academic expectations mediate child kindergarten outcomes (controlling for baseline child skills and relevant child and family characteristics).

Of particular importance was to control for child and family characteristics that might influence and confound interpretations about parent academic expectations, such as the child's cognitive ability and preschool academic performance, child behavior problems, family SES, maternal depression, and single-parent status, all of which may influence academic expectations or feelings of parent efficacy to support child academic success (Gorard, See, & Davies, 2012).

Little is known about the best ways to enhance parent academic expectations. However, it was hypothesized that, by encouraging parents to set goals for their child's learning, celebrate their child's accomplishments, and feel effective in helping their child learn, REDI-P would promote positive changes in parent academic expectations (Martini & Sénéchal, 2012). In addition, based on the conceptual model guiding the design of REDI-P, it was hypothesized that the intervention effect on key parenting behaviors (parent interactive reading and parent-child conversations) would mediate intervention effects on child outcomes in social-emotional and literacy domains in kindergarten (Reese et al., 2010; Welsh et al., 2014). Based on developmental research linking parent academic expectations with child academic performance (Gorard et al., 2012), it was further hypothesized that, controlling for baseline expectations and child skills, intervention effects on parent academic expectations for their children would also contribute uniquely to and mediate these positive child outcomes. Prior analyses of the REDI-P study documented significant positive intervention effects on two of the parent behaviors studied here (i.e., parent-child conversations and parent use of interactive reading strategies, $ds = 0.27–0.28$) as well as significant intervention effects on kindergarten child outcomes (i.e., child literacy skills, teacher-rated academic performance, self-directed learning, and social competence; $ds = 0.25–0.29$; Bierman et al., 2015), thereby providing a strong foundation for the exploration of associations between parent gains and child outcomes in the present study.

## 2. Method

### 2.1. Participants

Over two successive years, parents of prekindergarten children attending 24 Head Start classrooms in three Pennsylvanian counties were sent letters describing a study evaluating home learning materials. To participate in the study, parents had to agree to a randomization procedure (a lottery) in which they would receive home learning materials through home visits

(the REDI-P intervention) or via mail (the control group). Of the eligible population, 52% agreed to participate in the study. The resulting sample consisted of 200 children (55% European-American, 26% African American, 19% Latino, 56% male, $M_{age} =$ 4.45 years, $SD = 0.29$) and their caregivers (89% mothers, 4% fathers, 5% grandmothers). Most parents had a high school education or less (86%) and were low-income, with a median annual income of $18,000, which is below the national poverty threshold (Assistant Secretary for Planning and Evaluation, 2013). Slightly over one-third of the sample (36%) were single parents; the others were married (36%) or living with a committed partner (25%). All parents reported that English was spoken in the home; 16% reported that Spanish was spoken as well. About half of the participating Head Start centers and classrooms were located in an urban area; the others were located in more rural regions characterized by small towns and agricultural areas. Children transitioned from 24 Head Start classrooms into 145 kindergarten classrooms, with a 5% attrition rate over the course of the study. No baseline child or family characteristics were systematically related to attrition.

## 2.2. Intervention

REDI-P included 10 home visits during the spring of the child's Head Start prekindergarten year and six "booster" sessions after the child transitioned into kindergarten. Visits followed a well-specified manualized curriculum, synchronized with the REDI classroom curriculum and targeting the same two domains of child language-literacy and social-emotional skills with evidence-based instructional practices. Each month, parents were provided with a "REDI activity club" box, which contained a "menu" of parent-child activities. These included stories featuring Preschool PATHS characters and themes (e.g., feelings, sharing and caring), scripted with embedded questions to support interactive reading and parent-child conversation. Dramatic play activities focused on literacy skills. For example, materials for "playing restaurant" at home included an alphabet soup letter identification game, menu sight words, and opportunities to practice writing when taking restaurant orders. Home visitors used videotapes and role plays to demonstrate positive teaching techniques, such as attending, encouraging, and extending conversations.

In addition, REDI-P incorporated motivational strategies designed to increase parent investment in their child's school readiness and efficacy beliefs. At the start of the program, parents completed card sorts and discussed their goals and concerns for their child's developmental progress and their capacity to support their child's success. Each session then began with a check-in that allowed parents to reflect on their accomplishments and challenges, and the growth they were observing in themselves as parents and in their children's skills. Each session ended with a review of the program materials menu, along with personalized goal-setting and commitments regarding future program implementation (e.g., "Which of these activities do you think your child will most enjoy?", "Which of these activities would you like to plan to do with your child?"). On three occasions during the course of the program, parents were videotaped interacting with their children using the REDI-P materials. These videotapes were later reviewed with parents in order to promote self-reflection and provide performance feedback on their implementation of the learning materials.

The six home visitors (all women; 5 European-American, 1 Latina) had professional training in early education or human services, and were recruited from the communities where the Head Start centers were located. Training workshops (5 days) led by the program developer and weekly group and individual calls with the intervention supervisor (an experienced home visitor and program co-developer) were used to support intervention delivery and discuss any implementation challenges. Group sessions focused on program concepts, content, and delivery (e.g., relationship-building, coaching strategies, motivational interviewing). Individual phone calls focused on the progress of individual families. In addition, the supervisor made a bi-monthly visit to each site, attending 20% of the home visits to provide individual feedback and guidance to each home visitor, and to assure standard intervention implementation across the various home visitors.

During the course of the intervention, home visitors tracked parent understanding and use of the home learning materials. Each visit home visitors asked parents how much they had used various materials, and in addition, used their observations and discussions to rate the quality with which parents implemented the program. On average, parents completed 12 sessions with home visitors ($M = 12.00$, $SD = 5.48$, range = 0–16). On a scale that required home visitors to rate parents on the amount and quality of use of the materials, the mean (averaged across sessions) was 2.27 out of a possible 3 ($SD = 0.54$, range = 0.74–3). Further analyses of this item suggested a high level of use for 38% of the families (e.g., most of the materials being used several times per week, mean rating 2–3 out of 3), a moderate level of use of the materials for 49% of the sample (e.g., some of the materials being used some of the time during the week, mean rating 1–2), and little to no use of the materials for 13% of the sample (mean rating 0–1). Analyses reported here are "intent to treat." In this approach, families that are randomized to the intervention condition remain in the intervention condition for analyses, regardless of the amount of intervention they received (e.g., families who were randomized to the intervention condition, but subsequently declined visits at any point in time were included as intervention participants who received no home visits). Relative to an "as treated" design, this approach may lead to a conservative estimate of intervention impact, but it preserves the full power of causal inference associated with the randomized design by safe-guarding against selection biases due to differential attrition between the intervention and control groups (Ten Have et al., 2008).

## 2.3. Data collection procedures

Parents who indicated interest in the study were visited in their homes by a team of two trained research assistants. After obtaining informed consent, parents were administered a structured interview by one research assistant while the other played with the child. This in-home interview was repeated in the spring of the kindergarten year. Parents were compensated $50 for each interview. At each of these times, children were tested by trained research assistants at their schools during "pull-out"

sessions. Prekindergarten assessments involved two 30-minute sessions; kindergarten assessments involved one 45-minute session. At each time point, a research assistant also delivered and explained the teacher ratings, which teachers completed on their own; teachers were compensated $10 per student. In Head Start, both lead and assistant teachers provided ratings. Pre-intervention assessments were completed in the fall of the Head Start prekindergarten year (October–November) and post-intervention assessments were completed 16–18 months later, in the spring of the kindergarten year (March–April).

### 2.4. Measures

#### 2.4.1. Parenting domains

Parent academic expectations are typically assessed by asking parents how far they expect their child to go in school (see review by Yamamoto & Holloway, 2010). In addition, some researchers have asked parents what grades they expect their children to get (Phillipson & Phillipson, 2007). In this study, parents were asked both questions: "Knowing your child as you do, how far do you think she or he will go in school?" and "Knowing your child as you do, what is the average grade you expect him/her to receive in school?" Each item was rated on a 7 point rating scale, with higher values indicating more positive academic expectations ($1 = 0$–$8th$ grade/lower than Cs; $7 = $ more than four years of college/receive As). The items were significantly correlated, ($r = 0.58$), but to reduce the possibility of biased results due to measurement error, we conducted a principal component analysis and used the extracted factor scores to form a weighted average representing parent academic expectations.

Parent-child interactive reading was assessed with an abbreviated version of the verbal participation subscale of the *Reading Belief Inventory* (DeBaryshe & Binder, 1994). Parents described their use of interactive reading strategies (e.g., I ask my child a lot of questions when we read, When we read, we talk about the pictures as much as we read the story) on 5 items, each rated with a 4-point scale (*strongly disagree* to *strongly agree*). Item responses were averaged, with higher scores reflecting a more interactive reading style. The internal consistency for this abbreviated version (sample $\alpha = 0.78$) is comparable to reliability found in prior research (DeBaryshe & Binder, 1994; Rodríguez, Hammer, & Lawrence, 2009).

Parent-child conversations were assessed with 4 questions (e.g., How many times in a typical week do you and your child have a conversation that lasts 10 min or more? How often does your child volunteer to tell you about something that happened when you were not with him or her?) each rated on a 6-point scale (*almost always* to *almost never*). Item responses were averaged (sample $\alpha = 0.56$) with higher scores reflecting longer conversations characterized by more child disclosure.

#### 2.4.2. Child kindergarten outcomes

Three measures were collected and combined into a composite representing child emergent literacy skills: 1) the Letter-Word Identification scale of the *Woodcock-Johnson Tests of Achievement III – Revised* (Woodcock, McGrew, & Mather, 2001), which assessed letter knowledge and sight word recognition; 2) the Letter Naming Fluency subscale of the *Dynamic Indicators of Basic Early Literacy Skills* (Good & Kaminski, 2002), which tallied the number of letters correctly identified in one minute and a parallel task designed for this study involving Letter Sound Fluency, which tallied the number of letter sounds children could produce correctly in one minute, and 3) the *Test of Word Reading Efficiency* (Torgesen, Wagner, & Rashotte, 1999), which gave children 45 s to read as many sight words and then as many phonetic non-words as they could. These measures were standardized and averaged to represent emergent literacy skills (sample composite $\alpha = 0.82$).

Children's academic performance in the classroom was assessed via teacher ratings on the Academic Success subscale of the *Academic Performance Rating Scale* (DuPaul, Rapport, & Perriello, 1991), which included ratings of the accuracy and quality of work in language arts and math (rated $1 = poor$ to $5 = excellent$; sample $\alpha = 0.90$) as well overall performance in reading, writing, math, and general academic skills, relative to classroom expectations (rated $1 = near the very bottom of the class$ to $5 = near the very top of the class$; sample composite $\alpha = 0.91$). These scores were standardized and averaged ($r = 0.83$) to create an academic performance score.

To assess self-directed learning, teachers rated children's learning-oriented behaviors in the classroom using 5 items from the *School Readiness Questionnaire* (e.g., can work independently; has the self-control to do well in school; can follow the rules and routines that are part of the school day; Bierman et al., 2008) and 5 items from the *Learning Behaviors Scale* (e.g., accepts new tasks without resistance; McDermott, Green, Francis, & Stott, 1999). Items were rated on a 6-point Likert scale ($1 = strongly disagree$ to $6 = strongly agree$) and averaged to create a composite score to represent self-directed learning (sample $\alpha = 0.91$).

Finally, to assess children's social competence, teachers rated children's prosocial behavior (e.g., sharing, helping) and emotion regulation (e.g., ability to calm down when upset) using the 13-item Social Competence Scale (CPPRG, 1995). Items were rated on a 6-point Likert scale reflecting rate of display ($1 = never$ to $6 = almost always$; sample $\alpha = 0.94$).

#### 2.4.3. Additional covariates

To control for the influence of children's pre-intervention functioning, baseline measures of child outcomes were obtained and included in all analyses. In addition, pre-intervention measures of child and family characteristics that might influence and confound interpretations about parent academic expectations were included as control variables. These included measures of child cognitive ability, including expressive vocabulary (*Expressive One-Word Picture Vocabulary Test,* Brownell, 2000), non-verbal intelligence (Block Design subtest from the *Wechsler Preschool and Primary Scale of Intelligence – III*; Wechsler, 2002), and executive functioning (the *Peg Tapping* test designed by Diamond & Taylor, 1996). Child problem behaviors were also controlled, using ratings of aggressive-disruptive behavior from the *Teacher Observation of Child Adaptation-Revised* (Werthamer-Larsson, Kellam, & Wheeler, 1991). In addition, the following family characteristics were controlled in all analyses: family SES, maternal depression, and single-parent status.

### 2.5. Analytic plan

#### 2.5.1. Missing data

All demographic and study variables were subjected to missing value analysis. The total percentage of missing values was 3.2%. Little's Missing Completely at Random (MCAR) test was not significant, $\chi^2$ (266) = 230.40, $p = 0.94$, suggesting data were missing at random. Missing data were addressed using full information maximum likelihood procedures.

#### 2.5.2. Clustering

Children were randomly assigned to the REDI-P intervention at the individual level (within classroom). However, an inspection of intraclass correlation coefficients (ICCs) suggested some dependency in the data associated with geography (county) and study cohort (ICCs ranged from 0.02 to 0.12). As even low ICC values can bias parameter estimates (Hayes, 2006), multilevel modeling techniques were used to account for clustering. Thus, while we report Level-1 intervention effects, all analyses also included county and cohort as Level 2 covariates.

#### 2.5.3. Modeling approach

The first analysis tested the impact of the REDI-P intervention on parent academic expectations. A cross-classified hierarchical linear model (PROC MIXED, SAS 9.3), with county and cohort serving as the Level 2, cross-classification variables was used for two reasons: 1) this analysis replicated the model used to test intervention main effects reported in the prior paper (Bierman et al., 2015), allowing for a direct comparison of the intervention effect sizes with the previously-reported parent outcomes, and 2) it provided estimates of the variance in academic expectations accounted for by the covariates. The second set of models tested mediation using multilevel path analyses (TYPE = TWOLEVEL COMPLEX, Mplus 7), with two clustering variables (county and cohort). These multilevel path analyses included tests of the main effect of intervention on the parent variables (replicating the HLM models) and enabled the inclusion of the three hypothesized mediators in the same model, thereby examining the specific effects of each mediator relative to the others. As with the HLM analyses, in these path analyses, county and cohort were modeled at Level 2, while the intervention indicator was modeled at Level 1. In line with recommendations by MacKinnon (2008) for two-wave multi-level longitudinal mediation models, mediators were represented by kindergarten variable values, controlling for prekindergarten values of the same variables. Given that the sampling distributions of mediated effects tend to violate normality assumptions, tests of mediated paths were evaluated by estimating asymmetric confidence intervals (MacKinnon, Fritz, Williams, & Lockwood, 2007).

#### 2.5.4. Effect size

In order to assess the magnitude of mediated effects, we computed $\kappa^2$ values (Preacher & Kelley, 2011), representing a ratio of the indirect effect relative to the maximum possible effect size. These values may be interpreted using Cohen's (1988) guidelines in which 0.01 is small, 0.09 is medium, and 0.25 or greater is considered a large effect.

## 3. Results

### 3.1. Preliminary analyses

At baseline, there were no significant differences between the control and intervention group on any study variables. Means and standard deviations for baseline (Head Start) and post-intervention (kindergarten) study variables are presented in Table 1. The mean level of academic expectations was 4.79 ($SD = 1.00$). This value represented an average of how far parents

**Table 1**
Descriptive statistics for study variables.

| Variable | N | Mean | SD | Minimum | Maximum |
|---|---|---|---|---|---|
| *Head Start* | | | | | |
| Parent academic expectations | 200 | 4.79 | 1.00 | 2.50 | 6.50 |
| Parent-child interactive reading | 200 | 3.17 | 0.43 | 1.40 | 4.00 |
| Parent-child conversation | 200 | 4.45 | 0.85 | 2.25 | 5.75 |
| Emergent literacy skills | 200 | 88.09 | 13.68 | 55 | 120 |
| Academic performance | 200 | 4.92 | 0.88 | 1.00 | 6.00 |
| Self-directed learning | 200 | 3.58 | 0.73 | 1.00 | 4.50 |
| Social competence | 200 | 4.05 | 0.86 | 1.96 | 5.92 |
| | | | | | |
| *Kindergarten* | | | | | |
| Parent academic expectations | 182 | 4.89 | 1.00 | 2.00 | 6.50 |
| Parent-child interactive reading | 182 | 3.28 | 0.40 | 2.20 | 4.00 |
| Parent-child conversation | 182 | 4.45 | 0.93 | 1.50 | 6.00 |
| Emergent literacy skills | 199 | 29.62 | 11.19 | 2.00 | 52.33 |
| Academic performance | 191 | 4.86 | 0.96 | 1.57 | 6.00 |
| Self-directed learning | 191 | 3.12 | 0.75 | 0.60 | 4.00 |
| Social competence | 191 | 4.29 | 0.94 | 1.38 | 4.29 |

*Note.* The measures used to assess literacy skills differed for the Head Start and kindergarten assessments.

expected their children to go in school, between 4 (attend a vocational or technical school) and 5 (some college–associate's degree), and expected average grades, between 4 (Bs) and 5 (As and Bs). The range extended down to 2 (complete 9th–11th grade; attain Cs) and up to 6.5 (attain a BA degree or more; attain all As).

Interestingly, even within this low income sample, prekindergarten academic expectations were significantly correlated with family SES ($r = 0.17$) and parent education levels ($r = 0.19$), but not with maternal depression or single-parent status.

Correlations among the parenting and child variables in this study, assessed at pre- and post-intervention, are presented in Table 2. Most variables showed moderate stability across the Head Start to kindergarten contexts ($r$ ranged from 0.47 to 0.60, except for literacy skills, with $r = 0.22$). At both time points, parent academic expectations were mildly correlated with levels of parent-child conversation and (in kindergarten only) with reading quality. Academic expectations and parent-child conversation (but not reading quality) were also significantly correlated with child academic performance, self-directed learning, and (kindergarten only) literacy skills, but not social competence. Inter-correlations among the child outcomes were generally in the moderate range, although shifts emerged over time. Relative to Head Start, kindergarten teacher ratings of child self-directed learning and academic performance were more highly associated with the tests of emergent literacy skills.

## 3.2. Intervention impact on parent academic expectations

The first analysis tested the hypothesis that the REDI-P program had a positive impact on parent academic expectations. To provide comparability with the previously-reported tests of intervention main effects (Bierman et al., 2015), cross-classified hierarchical linear models were applied. Level 1 control variables included child characteristics (age, sex, pre-intervention vocabulary, block design, peg tapping, and aggression), family demographics (SES, single-parent status, and maternal depression), and pre-intervention academic expectations. Level 2 variables were county and cohort. Random intercepts were specified, with an unstructured variance-covariance matrix.

Table 3 presents intervention and covariate effect estimates. These analyses showed that, accounting for baseline academic expectations and multiple control variables, the REDI-P intervention significantly predicted increases in parent academic expectations for their children ($\beta = 0.32$, $p < 0.01$). In this model, academic expectations were grand-mean centered and standardized, so that the coefficient for the intervention effect is comparable to an effect size; $d = 0.32$ is a small to moderate effect (Cohen, 1988). Similarly, when the main effect of intervention was tested in the multi-level path models described below, the effect on academic expectations was significant, $\beta = 0.26$, $p < 0.01$.

## 3.3. Testing for mediation of intervention outcomes

Next, analyses were undertaken to test the degree to which intervention effects on three dimensions of parenting (parent-child interactive reading, parent-child conversation, and parent academic expectations) mediated the intervention impact on child outcomes (emergent literacy skills, academic performance, self-directed learning, and social competence). Mediation was tested using multilevel path analyses. For each model, we reported the overall chi-square test ($\chi^2$), which is ideally non-significant; however, this statistic is sensitive to sample size and is not generally used as a standalone indicator of model fit (Brown, 2006). Thus, we also reported the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Following recommendations by Hu and Bentler (1998), we used CFI ≥ 0.95, RMSEA ≤ 0.06, and SRMR values ≤ 0.08 as cutoff values to indicate a reasonable fit of the data to the specified model. All models controlled for the set of level 1 child and family covariates and included county and cohort as level 2 variables.

**Table 2**
Correlations among study variables.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Head Start* | | | | | | | | | | | | | |
| 1. Academic expectations | – | | | | | | | | | | | | |
| 2. Interactive reading | 0.10 | – | | | | | | | | | | | |
| 3. Parent-child conversation | 0.29** | 0.16* | – | | | | | | | | | | |
| 4. Emergent literacy skills | 0.09 | −0.09 | 0.16* | – | | | | | | | | | |
| 5. Academic performance | 0.41** | −0.10 | 0.38** | 0.21** | – | | | | | | | | |
| 6. Self-directed learning | 0.37** | −0.10 | 0.37** | 0.21** | 0.96** | – | | | | | | | |
| 7. Social competence | 0.10 | −0.06 | 0.11 | 0.02 | 0.49** | 0.52** | – | | | | | | |
| *Kindergarten* | | | | | | | | | | | | | |
| 8. Academic expectations | 0.56** | 0.10 | 0.24** | 0.14 | 0.38** | 0.32** | 0.19* | – | | | | | |
| 9. Interactive reading | 0.07 | 0.47** | 0.14 | −0.09 | −0.09 | −0.08 | −0.09 | 0.16* | – | | | | |
| 10. Parent-child conversation | 0.24** | 0.17* | 0.54** | 0.13 | 0.27** | 0.23** | 0.12 | 0.33** | 0.30** | – | | | |
| 11. Emergent literacy skills | 0.17* | 0.05 | 0.12 | 0.22** | 0.38** | 0.35** | 0.28** | 0.32** | 0.07 | 0.14 | – | | |
| 12. Academic performance | 0.31** | −0.03 | 0.21** | 0.30** | 0.56** | 0.52** | 0.44** | 0.47** | 0.00 | 0.24** | 0.63** | – | |
| 13. Self-directed learning | 0.22** | 0.02 | 0.25** | 0.11 | 0.57** | 0.60** | 0.74** | 0.31** | 0.03 | 0.21** | 0.46** | 0.64** | – |
| 14. Social competence | 0.23** | −0.08 | 0.24** | 0.11 | 0.76** | 0.79** | 0.56** | 0.18* | −0.13 | 0.20** | 0.18* | 0.32** | 0.49** |

* $p < 0.05$.
** $p < 0.01$.

**Table 3**
HLM estimates of fixed effects on growth in parent academic expectations.

| Fixed effect | Coefficient | Standard error | t-Ratio | p-Value |
|---|---|---|---|---|
| Intercept | 0.62 | 1.08 | 0.57 | 0.67 |
| REDI-P intervention | 0.32 | 0.12 | 2.63 | <0.01 |
| Control variables | | | | |
|   Pre-intervention | 0.56 | 0.06 | 9.02 | <0.001 |
|   Academic expectations | | | | |
| Family demographics | | | | |
|   SES | −0.01 | 0.01 | −0.23 | 0.08 |
|   Maternal depression | 0.05 | 0.12 | 0.39 | 0.70 |
|   Single-parent status | −0.03 | 0.12 | −0.23 | 0.82 |
| Child characteristics | | | | |
|   Gender | −0.09 | 0.12 | −0.76 | 0.45 |
|   Age | −0.10 | 0.19 | −0.53 | 0.59 |
|   Aggression | 0.28 | 0.11 | 2.43 | <0.05 |
|   Vocabulary | 0.00 | 0.00 | 0.54 | 0.59 |
|   Peg-tapping | −0.01 | 0.01 | −0.56 | 0.58 |
|   Block design | 0.06 | 0.01 | 4.18 | <0.001 |

Separate models were run for each child outcome. In each case, a baseline model estimated the direct effect of the intervention on child outcomes. Then, the mediators (post-intervention values, controlling for pre-intervention) were entered into these models to assess the degree to which intervention gains in the three parenting variables accounted for intervention gains in child skill domains.

In the first model, shown in Fig. 1, child literacy skills in kindergarten served as the outcome. At the top of the figure, as expected based on the prior HLM analyses (Bierman et al., 2015), the direct effect of the REDI-P intervention was significant in this path model, $\beta = 0.30$, $p < 0.01$. Then three parent mediators (post-intervention controlling for pre-intervention) were added to the model, producing an adequate fit to the data, $\chi^2$ (37, $N = 200$) = 52.79, $p < 0.05$; CFI = 0.95; RMSEA = 0.05; SRMR = 0.02 (see the lower part of Fig. 1), and reducing the direct impact of the intervention. Significant paths from the REDI-P intervention to these parent variables were expected based on HLM analyses documenting significant intervention effects on these parenting variables, and they emerged as anticipated. The paths from the parent variables to emergent literacy skills revealed one significant indirect path; intervention-related gains in parent academic expectations significantly predicted emergent literacy skills in kindergarten, whereas gains in parent-child interactive reading and parent-child conversations did not. A test of the asymmetric confidence intervals demonstrated that intervention-related gains in parent academic expectations significantly mediated intervention effects on emergent literacy skills, $\mu = 0.07$, $p < 0.05$, 95% confidence interval [CI] for the mediated effect = 0.015–0.137. The mediated effect was small ($\kappa^2 = 0.03$).

In the second model, shown in Fig. 2, teacher-rated kindergarten academic performance served as the outcome. The direct effect of the REDI-P intervention promoting academic performance is depicted in the top half of the figure, $\beta = 0.28$, $p < 0.01$. The three parent mediators were entered into the model (lower part of the figure), producing a good fit to the data, $\chi^2$ (39, $N = 200$) = 48.39, $p = 0.14$; CFI = 0.98; RMSEA = 0.04; SRMR = 0.02, and this direct effect was reduced to non-significance. Again, parent academic expectations emerged as the only parent variable that significantly predicted child academic performance in this model. A follow up test revealed significant mediation, $\mu = 0.06$, $p < 0.05$, CI = 0.017–0.107. The associated effect size for this mediation was small ($\kappa^2 = 0.04$).
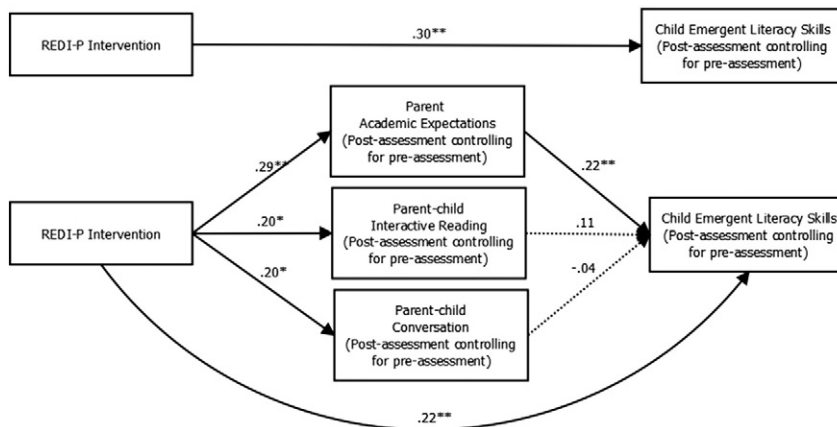


**Fig. 1.** Mediation model predicting child literacy skills in kindergarten. Control variables include pre-intervention literacy skills, family SES, parent education, maternal depression, single parent family, child gender, age, aggression, vocabulary, block design, and peg-tapping. *p < 0.05. **p < 0.01.
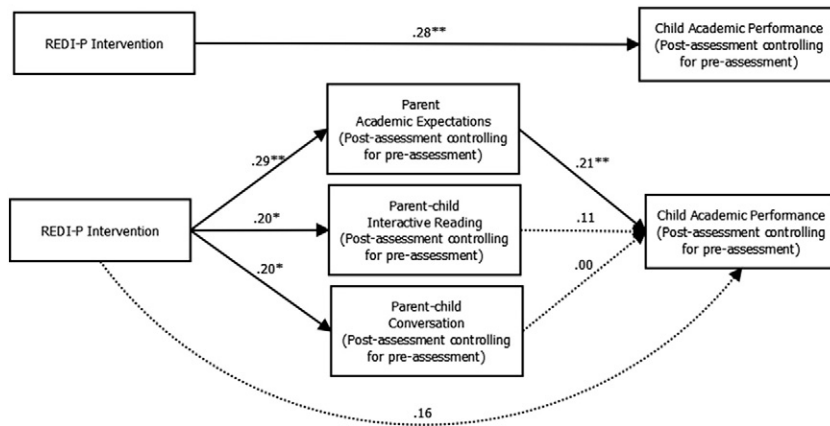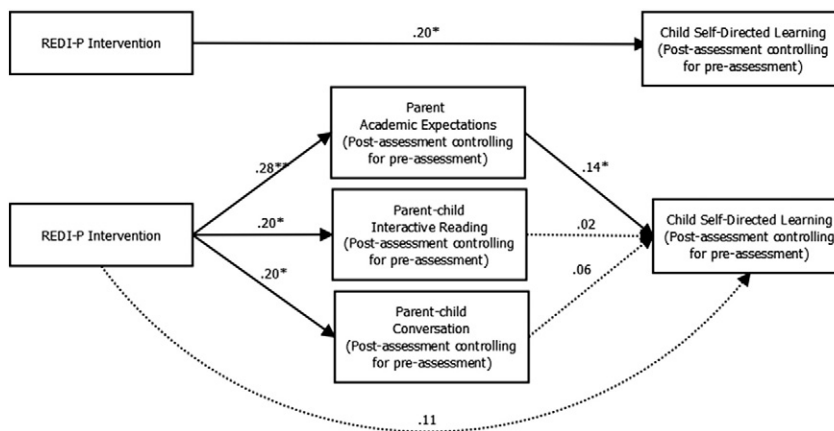
**Fig. 2.** Mediation model predicting teacher-rated academic performance in kindergarten. Control variables include pre-intervention academic performance, family SES, parent education, maternal depression, single parent family, child gender, age, aggression, vocabulary, block design, and peg-tapping. $*p < 0.05$. $**p < 0.01$.

The third model (Fig. 3) predicted teacher-rated self-directed learning in kindergarten. Similar to the first two models, the initial direct effect of intervention on self-directed learning, $\beta = 0.20$, $p < 0.05$, was reduced to non-significance once the parent mediators were entered into the model, $\chi^2$ (39, $N = 200$) = 48.39, $p = 0.14$; CFI = 0.98; RMSEA = 0.04; SRMR = 0.02. In this model, parent academic expectations again represented the only significant path predicting gains in child self-directed learning. A follow up test revealed significant mediation, $\mu = 0.06$, $p < 0.05$, CI = 0.015–0.115. This mediated effect size was small ($\kappa^2 = 0.03$).

Finally, Fig. 4 illustrates the path model predicting children's social competence. Although the addition of the parent change variables produced an adequate-fitting path model, $\chi^2$ (40, $N = 200$) = 58.80, $p < 0.05$; CFI = 0.95; RMSEA = 0.05; SRMR = 0.02, and reduced the direct intervention effect on social competence, $\beta = 0.18$, $p < 0.05$, to non-significance, none of the pathways between the parent mediators and child social competence were statistically significant.

### 3.4. Testing for reverse mediation effects

Although we expected growth in parent behaviors and expectations to mediate the intervention effects on child outcomes, it was also possible that the reverse occurred (i.e., child gains mediated intervention impact on parent academic expectations). To rule out this possibility, this alternative model was tested. First the direct effect of the intervention on kindergarten parent academic expectations, controlling for prekindergarten expectations, was modeled in a path analysis (see the top part of Fig. 5). Then, child kindergarten outcomes, controlling for prekindergarten values, were added as potential mediators into the path model. In each case, gains in child skills were either marginally or significantly associated with gains in parent academic expectations; however, adding in child gains did not reduce the direct impact of the intervention on parent academic expectations to non-significance in any of these models. Hence, child skill acquisition during the intervention promoted positive changes in parent academic expectations, but in addition, the intervention had a direct (non-mediated) positive impact on parent expectations.



**Fig. 3.** Mediation model predicting teacher-rated self-directed learning in kindergarten. Control variables include pre-intervention self-directed learning, family SES, parent education, maternal depression, single parent family, child gender, age, aggression, vocabulary, block design, and peg-tapping. $*p < 0.05$. $**p < 0.01$.
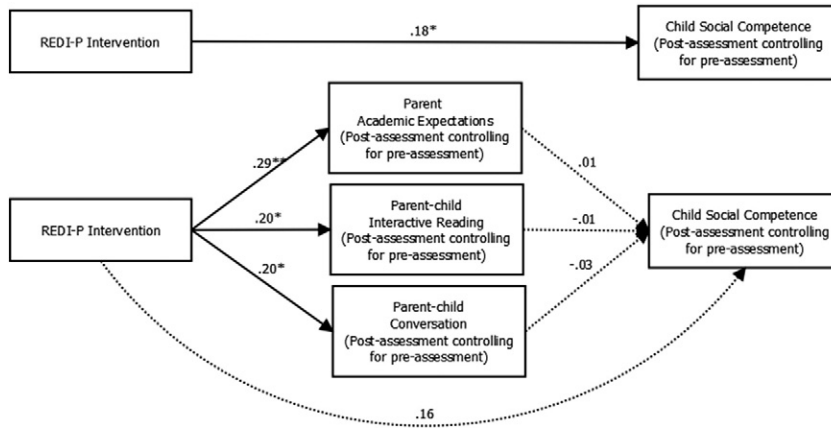
**Fig. 4.** Mediation model predicting teacher-rated social competence in kindergarten. Control variables include pre-intervention social competence, family SES, parent education, maternal depression, single parent family, child gender, age, aggression, vocabulary, block design, and peg-tapping. $*p < 0.05$. $**p < 0.01$.

## 4. Discussion

The present findings document that the REDI-P intervention significantly promoted parent academic expectations, in addition to promoting the positive changes in parent-child interactive reading and parent-child conversations reported in a prior study (Bierman et al., 2015). In addition, intervention-driven gains in parent academic expectations emerged as a primary mediator of children's outcomes on measures of emergent literacy skills and teacher-rated self-directed learning. Follow-up tests indicated significant indirect paths for these outcomes, in models that controlled for child pre-intervention levels and a host of other child and family characteristics. These findings suggest a need for closer attention to the beliefs parents hold about their child's academic potential in future intervention research targeting low-income families, in order to better understand the characteristics of interventions that promote positive academic expectations and how these expectations function to support child school attainment.
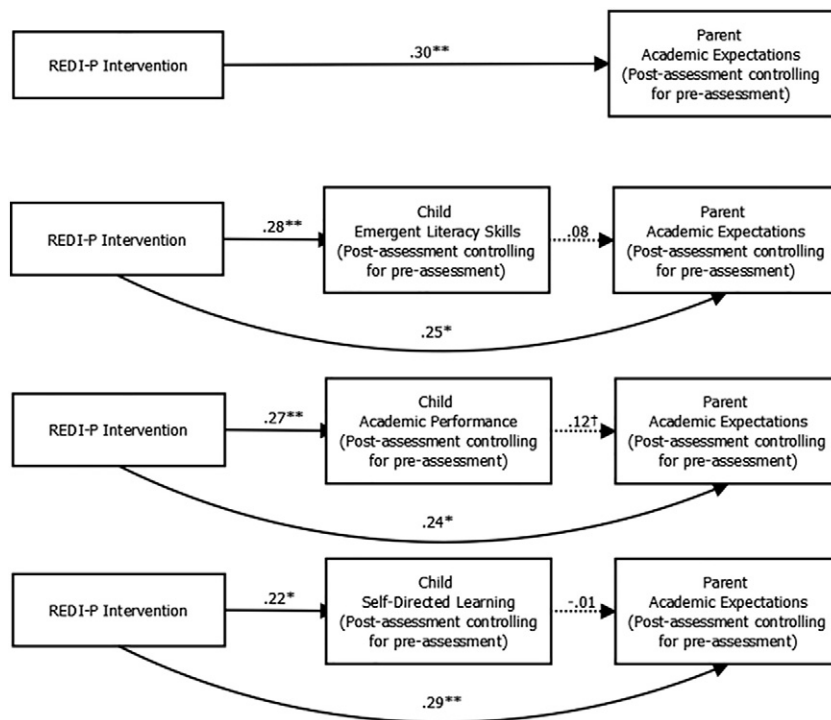


**Fig. 5.** Tests of child improvements mediating gains in parent academic expectations. Control variables include pre-intervention social competence, family SES, parent education, maternal depression, single parent family, child gender, age, aggression, vocabulary, block design, and peg-tapping. $*p < 0.05$. $**p < 0.01$.

### 4.1. Intervention effects on parent academic expectations

A number of prior studies have shown that parent academic expectations serve as a protective factor for child school outcomes in the face of adverse circumstances (e.g., De Civita et al., 2004; Hopson & Weldon, 2013) and as a mediator between family SES and child achievement (Grinstein-Weiss, Yeo, Irish, & Zhan, 2009). The present findings add to this literature by examining parent academic expectations in the context of a randomized experiment with low-income families, showing both that academic expectations are malleable and suggesting that increases in parent academic expectations may be one critical element in an early intervention that supports child academic gains.

Interpretations about the active elements of the REDI-P intervention that promoted positive academic expectations are only speculative, but there are several possibilities. The parent-child activity components of REDI-P were relatively brief and straightforward. By providing simple, high quality instructional materials to parents in combination with coaching by the home visitors, the program made it easy for parents to feel effective in their efforts to teach their children and promote child school readiness skills. Prior studies have linked higher levels of parent-child involvement and feelings of parent self-efficacy with higher parent academic expectations (Child Trends, 2012). In addition, the REDI-P program included individualized goal-setting and self-reflection activities specifically designed to motivate parents to focus on promoting their child's school readiness and to observe their child's skill acquisition and their success in promoting it. These activities may well have enhanced parent values for education and their beliefs that their children were ready for school and would succeed in that context, thereby enhancing their expectations (Eccles & Wigfield, 2002). These experiences may also have bolstered parents' feelings of self-efficacy with regard to teaching their children and, as a result, increased their confidence that they could effectively support their child's school success (Harackiewicz, Rozek, Hulleman, & Hyde, 2012).

Alternatively, or in addition, parent's expectations for their children may have risen as they observed, both independently and through the encouragement of the home visitor, that their children were, indeed, benefitting from the REDI-P program and acquiring key school readiness skills. It is interesting to note that parent use of the home learning materials as rated by the home visitors during the intervention did not predict changes in parent academic expectations; however, the number of intervention sessions that parents attended did ($r = 0.28$, $p < 0.05$). These findings are consistent with the hypothesis that the goal-setting, reflection, and coaching activities during sessions played more of a role in promoting positive expectations than did the use of specific learning activities or teaching strategies alone.

It is also possible that positive feedback from the teacher or child at kindergarten entry bolstered parents' confidence in their child's capacity to succeed in the school context. Prior studies have shown that parents adjust their academic expectations over time based on feedback regarding student academic performance (Zhang, Haddad, Torres, & Chen, 2011). In the present analyses, the gains in school readiness skills that children made between the pre- and post-intervention assessments predicted increases in parent academic expectations; however, those gains did not mediate intervention effects on academic expectations, suggesting that other aspects of the intervention beyond child skill acquisition also influenced parent academic expectations. The present study design does not allow for a clear determination of the mechanisms of action whereby intervention improved parent academic expectations. However, they document the potential importance of this aspect of parenting, and suggest that parent academic expectations be included as a core outcome variable in other parent-focused school readiness interventions.

### 4.2. Parent mediators of intervention impact on child outcomes

Identifying the mechanisms whereby gains in parent academic expectations mediated child academic outcomes also requires speculation, as there are a number of factors that may have contributed to this effect. Yamamoto and Holloway (2010) proposed that children may perceive and internalize their parents' expectations, leading them to feel motivated and capable when navigating the challenges associated with school. Children who received the REDI-P program may have noticed their parents' increased interest and belief in their academic growth and, as a result, felt more confident as they transitioned to kindergarten. More positive academic expectations may also have influenced the way parents treated their children or related to the school in unmeasured ways, thereby amplifying support for child school success. For example, several studies have found that academic expectations predict the degree to which parents get involved in their children's education through activities such as volunteering in the classroom and helping with homework (Jones & White, 2000). In addition, studies suggests that academic expectations are also associated with the complexity of language parents use with their children around academic topics, such as math and science (Tenenbaum & Leaper, 2003). These parent activities and behaviors, in turn, may both communicate to children that school is an important priority and provide children with instrumental support for learning.

In this study, gains in expectations uniquely contributed to and mediated gains in child literacy skills (assessed directly) and gains in self-directed learning (as rated by kindergarten teachers), suggesting particular impact on child academic progress. It is of note, however, that gains in expectations did not mediate children's outcomes in the area of social competence. This suggests a very specific link between parent academic expectations and child academic performance, rather than a more global association with positive parent support for child development in general.

Counter to expectations, intervention-driven gains in parents' use of interactive reading strategies and increased parent-child conversation did not significantly mediate any child outcome. Mediation was expected, given prior research linking these parenting behaviors with children's academic success (Cristofaro & Tamis-LeMonda, 2012; Zimmerman et al., 2009). A prior study of REDI-P suggested that children made more academic gains during intervention when their parents had high levels of warmth and responsiveness at baseline; conversely parents gained more warmth and responsiveness during intervention when they

had low levels at baseline (Mathis & Bierman, 2015). In other words, children and parents each benefitted from the intervention, but in different ways. It is possible that a similar process occurred here, creating a lack of concurrence between child and parent gains. Alternatively, the very specific behaviors of interactive reading and parent-child conversations, while sensitive to intervention effects, may not have adequately captured the qualities or characteristics of parent-child interactions that were associated with improved child outcomes. That is, it may be that, rather than parents' changes in reading and language behaviors influencing children's outcomes, the effects on child outcomes found in this study were driven by the broader effect of the intervention on unmeasured parent use of in-home learning materials, and not isolated to the documented intervention impact on the specific behaviors of parent-child conversations and interactive reading.

### 4.3. Strengths and limitations

This study examined the mechanisms of change in a parent-focused school readiness intervention. It is one of only a handful of studies that have undertaken this type of intervention process research and the only study we know of to examine parent academic expectations as an intervention mediator. Findings are strengthened by the overall study design, which randomized parents to an intervention and control group, and by the use of multi-informant, multi-method assessment strategies, including parent-report, teacher-report, and direct assessment of children.

One study limitation is that the construct of parent academic expectations, while found to mediate intervention effects, was measured with a two-item scale. A broader representation and measurement of parent academic expectations might have both increased reliability and provided a more nuanced understanding of the ways in which these expectations were influenced by intervention and how they, in turn, affected parenting behaviors or responses to children. In addition, related constructs such as parent efficacy were not measured, limiting the degree to which the construct of parent academic expectations can be fully interpreted. Furthermore, the low reliability of the measure of parent-child conversations may have attenuated the effect of a possible parent behavioral mediator. Thus, although this study demonstrates that academic expectations may be an important target of intervention, more research is needed to better understand the nature of these expectations and how they affect and are affected by intervention.

Also requiring further investigation is the finding that neither parent gains in use of interactive reading strategies nor parent-child conversations mediated child outcomes in this intervention. This is somewhat unexpected given the consistent cross-sectional association between children's academic performance and parents' use of language and interactive reading. Given the few studies that have examined links between these parenting behaviors and child outcomes in the context of an experimental intervention, it remains unclear whether the present findings are an anomaly associated with this intervention or measurement strategy, or whether they will generalize to other intervention studies. One prior study also failed to show links between improved parent language use and child cognitive development (Madden et al., 1984), but clearly additional research testing assumed intervention mediators is needed.

It is also important to note that this study focused on a low-income Head Start sample. The degree to which these findings generalize to other samples, particularly samples with a broader range of family SES, is unknown. In addition, only 52% of the eligible Head Start parents responded to the letter inviting them to participate in this study evaluating home learning activities. In general, it is challenging to recruit parents into universal prevention programs such as this one; in their review Axford, Lehtonen, Kaoukji, Tobin, and Berry (2012) estimate that generally only about a third of invited families enroll in prevention projects, and 40–60% drop out. In the present study, parents were randomized to receive the home visit intervention (versus mail-home math activities) after they were recruited, thereby providing a rigorous and unbiased test of the intervention impact. Yet, the potential impact on the other 48% of non-participating parents is unknown.

Finally, this study included a large number of child and family characteristics as control variables, in order to reduce the possibility that other factors associated with parent academic expectations confounded the interpretation of the findings. Yet, it is still possible that unmeasured factors were involved, limiting the capacity to draw clear causal interpretations or identify the mechanisms that underlie the associations found between growth in parent academic expectations in growth in child literacy skills and self-directed learning.

### 4.4. Future directions

Given the profound ramifications of a child's academic performance at school entry for later achievement, psychosocial, and health-related outcomes as well as the demonstrated amenability of school readiness to intervention (Yoshikawa et al., 2013), it is crucial to understand the specific program components and mechanisms of change that will maximize intervention efforts. Substantial evidence suggests that early interventions that help parents enrich support for learning at home may reduce the SES gap in school readiness and academic achievement (Reese et al., 2010; Welsh et al., 2014); when timed strategically, parent-focused interventions may also help sustain gains made in preschool programs as children transition into elementary school (Bierman et al., 2015). The results of this study suggest that parents' beliefs and expectations regarding their children's academic success may represent an additional powerful, but as yet untapped, target for intervention efforts. Certainly, additional research is needed, both to better understand the developmental dynamics associated with parent academic expectations, as well as to more fully explore processes of change in early interventions, in order to maximize benefits for parents and children. From its inception in the 1960s, Head Start has been committed to engaging parents in their children's education, and home visits are a mandated Head Start service. However, little empirical evidence exists to guide home visitors in optimal strategies for increasing

parent engagement in ways that will maximize benefits to children. The present findings suggest that, in addition to focusing on parent behaviors that support child learning, parent beliefs about their children, particularly their academic expectations, may be responsive to home visit interventions and may play a key role in promoting child gains in school readiness. These findings suggest that home visitors should focus on parent beliefs, particularly their academic expectations, as well as parenting behaviors during early interventions, and should track progress in both domains (expectations and parent behaviors), particularly for preschool children making the transition into kindergarten.

### 4.5. Conclusions

Extending the empirical literature that has linked parent academic expectations with child academic performance in cross-sectional and longitudinal studies, the present findings suggest that parent academic expectations are malleable. Indeed, the results showed that the REDI-P intervention which supported parents in teaching their young children at home, promoted significant gains in parent academic expectations, which in turn mediated intervention gains in child emergent literacy skills and self-directed learning. The findings highlight the importance of further research on parent academic expectations, particularly the factors that may contribute to and promote positive changes in those expectations. In addition, the findings highlight the need to expand research on the processes of change associated with school readiness interventions, in order to better understand how these programs are attaining their positive effects on children. While a number of parent-focused intervention programs exist, the results presented here suggest that their mechanisms of action may not be straightforward. Only by carefully assessing the associations between intervention impact on parents and intervention impact on children can the proposed change mechanisms underlying these interventions be tested.

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