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Encouraging Parenting Behaviors That Promote Early Childhood Development Among Caregivers From Low-Income Urban Communities: A Randomized Static Group Comparison Trial of a Primary Care-Based Parenting Program

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Abstract

Objectives—Encouraging key parenting behaviors in early infancy may help decrease income-related developmental disparities. In this study we assessed whether a brief, primary care-based program (Sit Down and Play; SDP) could be successful in impacting key parenting behaviors that promote early childhood development.

Methods—An ethnically diverse group of predominantly low-income caregivers of children 2–6 months of age were enrolled, interviewed, and randomized to intervention (n=20) or control (n=20) groups. Intervention families received SDP at recruitment and the subsequent well-child visit. Control families were provided handouts regarding developmental milestones. One month after the second well-child visit, all families were reinterviewed (n=34; 85% retention rate). Using open-ended questions and standardized measures (i.e., StimQ), parents were asked about parenting behaviors central to children's development: 1) participation in cognitively stimulating activities, 2) provision of learning materials, and 3) the quality of parent-child verbal interactions. Potential impact on perceived parenting confidence was also explored utilizing The Parenting Sense of Competence Scale. Analyses were conducted using chi square tests and analysis of variance.

Results—A significant main effect of time, and as hypothesized, an interaction between time and condition emerged that favored SDP on play behaviors (p=0.03). Post-intervention, SDP families had significantly higher levels of interactional activities between a parent and child that promote cognitive development (p=0.02).

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Conclusions for Practice—Results appear promising for an accessible, low-intensity program delivered in the primary care setting. Further studies to determine the effectiveness of SDP on parenting behaviors and subsequent developmental outcomes are warranted.

INTRODUCTION

An infant's environment and early social experiences are crucial for brain development including neural processes that influence early childhood development and subsequent educational achievement (Shonkoff & Phillips, 2000). Converging economic, developmental, and biological research highlight the following key parenting behaviors as vital social experiences central to children's development: 1) early and frequent participation in cognitively stimulating activities (e.g., reading and play); 2) sensitive and responsive interactions; and 3) provision of learning materials, such as toys and books (Christakis, Zimmerman, & Garrison, 2007; Lugo-Gil & Tamis-LeMonda, 2008; McFarlane et al., 2010; Tamis-LeMonda, Bornstein, & Baumwell, 2001).

Although essential for all children, encouraging key parenting behaviors in early infancy may be particularly impactful for the nearly 15 million children living below the poverty threshold in the United States (Jiang, Ekono, & Skinner, 2017). Children growing up in poverty are at increased risk for poorer language, cognitive, and social-emotional outcomes in early childhood, predictors of later educational achievement. In part through negative influences on the home learning environment, parental mental health, and toxic stress exposure, these income-related developmental disparities, which can be apparent as early as 18 months of age, have profound effects on a child's life-course trajectory (Duncan & Brooks-Gunn, 2000; Fernald, Marchman, & Weisleder, 2013; Halle et al., 2009).

Importantly, a growing body of multidisciplinary research demonstrates that a cognitively-enriched home environment with sensitive parenting in early childhood infancy can help mitigate poverty-related effects on early developmental outcomes (Hair, Hanson, Wolfe, & Pollak, 2015; Luby et al., 2013). Consequently, interventions delivered through home visits, early education, and center-based programs have been developed to enhance parenting behaviors. Although some of these programs have impressively impacted parenting behaviors and early child outcomes, the question of how to implement these programs for millions of families living in low-income communities remains a significant challenge (Landry, Smith, & Swank, 2006; Olds, Sadler, & Kitzman, 2007).

One promising strategy for reaching vulnerable families is to utilize the primary care setting, a non-stigmatizing location of frequent and well-attended well-child visits. A number of programs have already capitalized on these advantages and incorporated child development specialists, home visits, or additional appointments within the pediatric setting to positively impact parenting behaviors (Shah, Kennedy, Clark, Bauer, & Schwartz, 2016). We sought to build on these successful models while addressing potential health care barriers of cost, attrition, and staffing to reach families who may benefit from a less intense population-level approach, with a specific emphasis towards families living in low-income communities.

We designed *Sit Down and Play (SDP),* a brief, primary care-based program that aims to encourage key positive parenting behaviors through take-home play activities. What makes *SDP* unique is its goal to develop sustainable, cost-effective primary care-based strategies that optimize developmental and health outcomes by: 1) using the untapped time that a family waits to be seen by their pediatrician in the examining room; 2) delivering the intervention during frequently scheduled and attended well-child visits, thereby requiring no additional appointments; and 3) providing brief, but theoretically-based content that facilitates implementation and delivery by non-professionals or volunteers. This approach, if successful, can be utilized to develop accessible and effective population-based programs in the primary care setting.

The development of a population-level primary care-based program to encourage early social experiences is an iterative process. Our goal in this study, and a formative step in this process, was to establish the feasibility of delivering SDP during subsequent well child visits and evaluate the potential impact of *SDP* on parenting behaviors among caregivers of children 2–6 months of age who attend a primary care clinic serving a predominantly high-poverty urban community.

METHODS

Setting

The intervention took place in a large, urban primary care clinic within a teaching hospital. The clinic serves 40,000 children annually, with over 80% of children receiving state-funded (e.g., Medicaid, Medicaid managed care) health coverage.

Primary caregivers of infants between the ages of 2 through 6 months of age were invited to participate in a prospective quasi-randomized static group comparison study. Forty participants were consecutively enrolled from June 27, 2016 to August 31, 2016 and allocated to receive the intervention or control based on the day of the week their infant's well-child visit was scheduled (intervention: Mondays and Wednesdays; control: Tuesdays and Thursdays). Inclusion criteria were: primary caregiver of a child between 2 through 6 months of age, at least 18 years of age, and child scheduled for a well-child visit. Caregivers were excluded if parents reported that their child was being seen for a sick visit or if they could not communicate in English.

Procedures

Caregivers were approached in the waiting area of the clinic and screened for inclusion and exclusion criteria. Eligible caregivers were told that a study was being conducted to assess how children spend their time. After receiving informed consent, researchers obtained baseline measures and met families in the examination room. Families in the control condition received Center for Disease Control and Prevention (CDC) handouts that provided information regarding children's development, including social-emotional, cognitive, language, and communication milestones appropriate for children ages 2 through 9 months ("CDC Developmental Milestones"). Parents were informed that the handouts were designed to provide information regarding a child's development and offered strategies on how they

could help support their child's development. No additional follow-up sessions were scheduled.

Families assigned to the intervention condition received *SDP* in the examination room at the enrollment visit and at the subsequent well-child visit. One month after the subsequent well-child visit, research assistants who were not informed of group assignment, contacted all participants for a follow-up phone interview. All participants received a $15 gift card at enrollment and a $25 dollar gift card after completion of the follow-up phone interview. The authors' Institutional Review Board approved this study. The results of the study were reported based upon the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) Statement for behavioral and public health interventions (Des Jarlais, Lyles, Crepaz, & the TREND Group, 2004).

Intervention

SDP is designed to be a brief, low-cost program that incorporates key constructs of social cognitive theory to encourage positive parenting behaviors through take-home play activities (Shah, DeFrino, Kim, & Atkins, 2017). The program is intended to be delivered by ancillary staff (e.g., hospital volunteers, community health workers) while parents wait for their child's primary care provider in the examination room of the clinic. During each 10-minute session, staff: (1) model examples of how to use simple age-specific toys to facilitate talking and playing with a child; (2) engage caregivers in discussions regarding their child's current developmental abilities and the importance of talking, playing, and interacting with their child; (3) observe caregivers using the toy to play with their child and provide feedback, which emphasizes praising and reinforcing positive behaviors; (4) give the caregiver the toy to take home with a handout containing suggestions for other simple play activities to do at home; and (5) encourage caregivers to incorporate playtime with their child as often as possible and provide suggestions on how to integrate play into daily activities such as diaper change and meal times to reinforce the importance of frequent parent-child play on their child's development. Toys were age-specific and included rattles for 2-month-olds, toy mirrors for 4-month-olds, balls for 6-month-olds, and stacking cups for 9-month-old children. Cost of the toys ranged from $3.99 to $9.99.

Administrators of *SDP* received training in a group format and used basic principles of active learning (e.g., demonstrations followed by discussions and role-playing) to provide content information regarding the importance of play and parent-child verbal communication for child development. Skills were also taught in the following key domains: 1) clear communication techniques (e.g., describing the importance of daily play interactions on a child's development with minimal jargon, use of toys to facilitate parent-child interactions); 2) modeling of targeted behaviors; and 3) providing feedback with positive reinforcement. An *SDP* Fidelity Checklist was adapted from the Chicago Parent Program Fidelity Checklist, a previously published measure to assess administrator adherence and competence delivering a parenting program serving low-income families (Breitenstein et al., 2010). The *SDP* Fidelity Checklist assessed *SDP* administrator competencies in each of the three key domains and a threshold score of 85% was required to verify each *SDP* administrator's acquisition of skills prior to delivery.

Measures

Demographic data were collected based upon a verbally administered questionnaire and included information regarding parental age, marital status, race/ethnicity, employment status, education level, estimated household income and child's age, gender, and insurance.

Feasibility-related outcomes of interest included ability to provide *SDP* at subsequent well-child visits, additional time needed to complete *SDP* in the examination room during office visits, and acceptability of *SDP* to caregivers, assessed via the ability to meet a recruitment target of 40 families and to retain 80% of those families.

The StimQ-Infant, a parent self-report scale that is administered as an interview, was used to assess parental behaviors that support children's early cognitive development (Dreyer, Mendelsohn, & Tamis-LeMonda, 1996). The StimQ has been utilized in several studies evaluating parent-directed interventions and demonstrates good internal consistency (Cronbach's α=0.88), test-retest reliability (intraclass correlation coefficient = 0.93) and predictive validity of early child development (correlation between StimQ and The Home Observation for the Measurement of the Environment Inventory = 0.55, $p < 0.001$) (Mendelsohn et al., 2007; Tomopoulos et al., 2006). In the present study, we used 3 subscales of the StimQ-Infant: 1) Availability of Learning Materials (ALM) to assess children's access to toys or other learning materials provided by the caregiver; 2) Parental Involvement in Developmental Advance (PIDA) to assess parent playing and teaching activities that promote children's cognitive development; and 3) Parental Verbal Responsivity (PVR) to assess parents' verbal interactions and responsivity to their child. Responses on the scales were summed and converted to scale scores ranging from 0 to 6 for the ALM, 0 to 7 for the PIDA and 0 to 11 for the PVR. To our knowledge, a self-report scale measuring parental behaviors that support children's early cognitive development in the first two months of life has not been validated. Thus, we administered the StimQ in the telephone follow-up only for all participants.

To further assess participation in cognitively stimulating activities, parents were asked at enrollment and in the telephone follow-up interview the following 2 questions about parent-child shared play: 1) "In the past week, how many days did you play together with your child using a toy?" and 2) "In the past week, how many times have you and your child played together with a toy?" Number of days parents reported playing with their child ranged from 0 to 7. Open-ended responses were recorded for parents' report of weekly playtime with their child.

The Parenting Sense of Competence Scale (PSOC) is a 16-item scale that provided an index of parent self-efficacy and confidence in parenting their children. Items reflect parents' overall perceptions of their parenting abilities in addition to their feelings of anxiety, frustration, and motivation in their role as parents (Johnston & Mash, 1989). Parents rate each item on a 6-point Likert scale with higher summed scores reflecting a greater sense of parental confidence and efficacy. The PSOC has strong internal consistency and test-retest reliability and has been used in previously published studies with low-income parents (Benasich & Brooks-Gunn, 1996; Weaver, Shaw, Dishion, & Wilson, 2008). We administered the PSOC at the enrollment visit and in the telephone follow-up.

DATA ANALYSIS

To assess acceptability, our goal in this study was to achieve a retention rate of 80%, which is comparable to other primary care-based parenting programs (High, LaGasse, L, Becker, Ahlgren, & Gardner, BS, 2000; Mendelsohn et al., 2005). Consequently, anticipating 20% attrition, we aimed to recruit a sample size of 40 participants which gives us 95% confidence that our estimated goal retention rate of 80% is accurate within 10 percentage points. Distributions of demographic characteristics at enrollment were compared between the *SDP* and control groups using chi-squared tests. For the measures obtained from participants in each group at the enrollment visit and in the telephone follow-up (amount of play and PSOC), we fitted repeated-measures (mixed effects) linear regression models with group (*SDP* or control), time (enrollment or follow-up) and group x time interaction predictors. For measures obtained only in the telephone follow-up (StimQ subscales), we fitted linear regression models with a fixed effect of group (*SDP* or control). All analyses were conducted on an intention-to-treat basis with α=0.05. We used R 3.3 and the lme4 package to conduct analyses (Bates, Martin, Bolker, & Walker, 2015).

RESULTS

A total of 122 caregivers were screened for the study, of which 13 indicated that they were not interested in participating and 69 were excluded from the study for failure to meet eligibility criteria, resulting in a total of 40 enrolled participants (Figure 1). After obtaining informed consent, families were allocated to receive *SDP* (intervention; n=20) or CDC handouts (control; n=20).

Characteristics of study participants are shown in Table 1. No significant baseline differences existed between intervention and control families. Of the participants enrolled, most caregivers were women (93%), less than 35 years of age (85%), non-white (88%), and reported incomes less than $50,000 (65%); most children received public health insurance (75%). Seventy-five percent of both intervention and control families attended 2 well-child visits.

Regarding feasibility, *SDP* was delivered at 100% of the attended well-child visits for the intervention group. Administrators of *SDP* delivered the program during the waiting period in the examination room of the well-child visit with no need for additional time. Six families were lost to follow-up (n=2 intervention; n=4 control), leaving 34 subjects for final analysis (85% retention rate). Rates of assessment were not statistically different between groups. Baseline characteristics of those caregivers lost to follow-up and retained did not statistically differ overall or by study condition.

Table 2 shows the results of a mixed linear model analysis of effects of *SDP* on parenting behaviors. Although this study was not powered for hypothesis testing, an exploratory analysis revealed a significant main effect of time, and an interaction between time and condition that favored *SDP* on the number of times per week parents reported playing with their child. Results demonstrated that there was not a significant change in pre- and post-intervention reports of playing with a child per week among parents in the control group,

while parents in the *SDP* group reported an increase by 14.1 times (Figure 2; Control pretest 23.25, 95% CI [20.4,26.1]; Intervention pretest 16.5, 95% CI [13.7,19.3]; Control posttest 19.0, 95% CI [15.4,22.6]; Intervention posttest 30.6, 95% CI [27.5,33.6], p=0.03).

Post-intervention, *SDP* families scored 1.4 points higher on the on the Stim-Q PIDA subscale than families in the control condition (Figure 3; Control 3.2, 95% CI [2.2,4.1]; Intervention 4.6, 95% CI [3.8,5.4], p=0.02). Although higher scores were noted for parent-child verbal interactions (p=0.06) and provision of learning materials (p=0.06) these scores were not statistically significant. No significant between-group differences on parenting self-efficacy and confidence emerged.

DISCUSSION

Public health, pediatric, and economic communities have called for population-based strategies to enrich parenting behaviors in early childhood as a means to promote early child development and subsequent well-being. Our results lend further support for utilizing the primary care setting to deliver a parent-directed program to facilitate key parenting behaviors. In this study, *SDP*, a brief, low-intensity primary care-based parenting program implemented during routine well-child visits in the first 6 months of a child's life, evidenced improvement in key aspects of parenting behaviors central to early childhood development. Specifically, *SDP* positively impacted play and parent teaching activities that are associated with promoting cognitive development.

Although higher scores were seen among families who received *SDP*, our results did not indicate a statistically significant impact of *SDP* on parent-child verbal interactions or the provision of learning materials. One explanation for this finding may be that more exposures to the program were needed than the one or two that families received in this study. Additionally, and as suggested by social cognitive theory, changes in parental self-efficacy (PSE) should positively impact changes in parenting behavior (Bandura, 2004). Our results demonstrated a lack of effect of *SDP* on PSE as measured by the PSOC, which may be an alternate explanation as to why changes in all parenting domains were not seen. Key constructs that can impact PSE, such as knowledge regarding the importance of parent-child interactions, were not measured in this study. Assessing effects of additional exposures of *SDP* on PSE and subsequent behavior change and evaluating these constructs will be helpful in illuminating underlying mechanisms of behavior change, the foundation for parent-directed programs.

Our study had several potential limitations. First, the small sample size, exclusion of families who did not speak English, and recruitment from a single practice preclude generalizability to a larger population. However, recruitment occurred within a large urban primary care setting and therefore the feasibility of the program for these settings is an important consideration. Second, outcomes were measured based upon self-report and not observational assessments, and thus may be susceptible to social desirability and recall bias. Additionally, due to the nature of the program, families allocated to the intervention arm could not be blinded to delivery of *SDP,* potentially leading to performance bias. However, we used instruments that have been validated in previously published studies to measure

parenting practices and parents were not informed of the purpose of the study both prior to and after delivery of *SDP*.

A third limitation is that baseline assessments of the StimQ were not obtained as they were not validated for parents of children 2 and 4 months of age. Therefore, we could not control for possible baseline differences across groups for that measure. However, given the importance of implementing a program that targets parenting behaviors in early infancy, we chose to deliver the program to caregivers of 2-month-olds despite the lack of validated measures at this age group. Fourth, allocation to the control versus intervention group was based upon day of the week, lending to selection bias. Future studies that aim to evaluate the efficacy of *SDP* will utilize randomization. Lastly, impacts on child outcomes were beyond the scope of this project and is an important goal for future studies.

Despite these limitations, the results from this study suggest promise for the applicability of *SDP* to urban parents who are at high risk for parenting difficulties. In addition, this study provides valuable direction for further improving the next iteration of *SDP*. Towards that goal, we have revised the curriculum of *SDP* to further emphasize the importance of talking and playing with young children, and now include assessments to evaluate impacts of this change, if any, on parenting knowledge. Second, because many children may not present to the well-child visit at 2 months of age, we are studying the impact of age of introduction of *SDP* and dosage on *SDP's* effects. Lastly, because *SDP* is designed to be a population-based program tailored to primarily urban, low-income communities, we plan to evaluate parental characteristics such as parenting stress and presence of depression symptoms that may be more prevalent in this population and may impact program uptake.

In summary, an abundance of literature demonstrates the importance of a child's early social experiences and home environment on early childhood development and subsequent well-being. Although parent-directed programs have shown promise in improving key parenting skills to promote early child development, there remains a gap in how to best disseminate these programs for widespread distribution. This study offers a positive step in developing an accessible, sustainable, and effective primary care-based program to encourage positive parenting behaviors. Further studies to determine the effectiveness of *SDP* on parenting behaviors and subsequent developmental outcomes are warranted and may provide an important strategy to promote early childhood development.

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SIGNIFICANCE STATEMENT

What is already known on this subject?

The primary care office offers an ideal setting to promote positive parenting behaviors and reduce income-related developmental disparities. However, how to more efficiently leverage this setting to provide a practical, effective, and sustainable program to support early child development in low-income urban communities remains a challenge.

What this study adds?

The parent-directed program, Sit Down and Play (SDP) described here offers a positive step in developing a brief, accessible, and effective primary care-based program to promote positive parenting behaviors. This approach may be considered in the implementation of existing and development of new population-based programs that aim to reduce poverty-related health and education inequities.

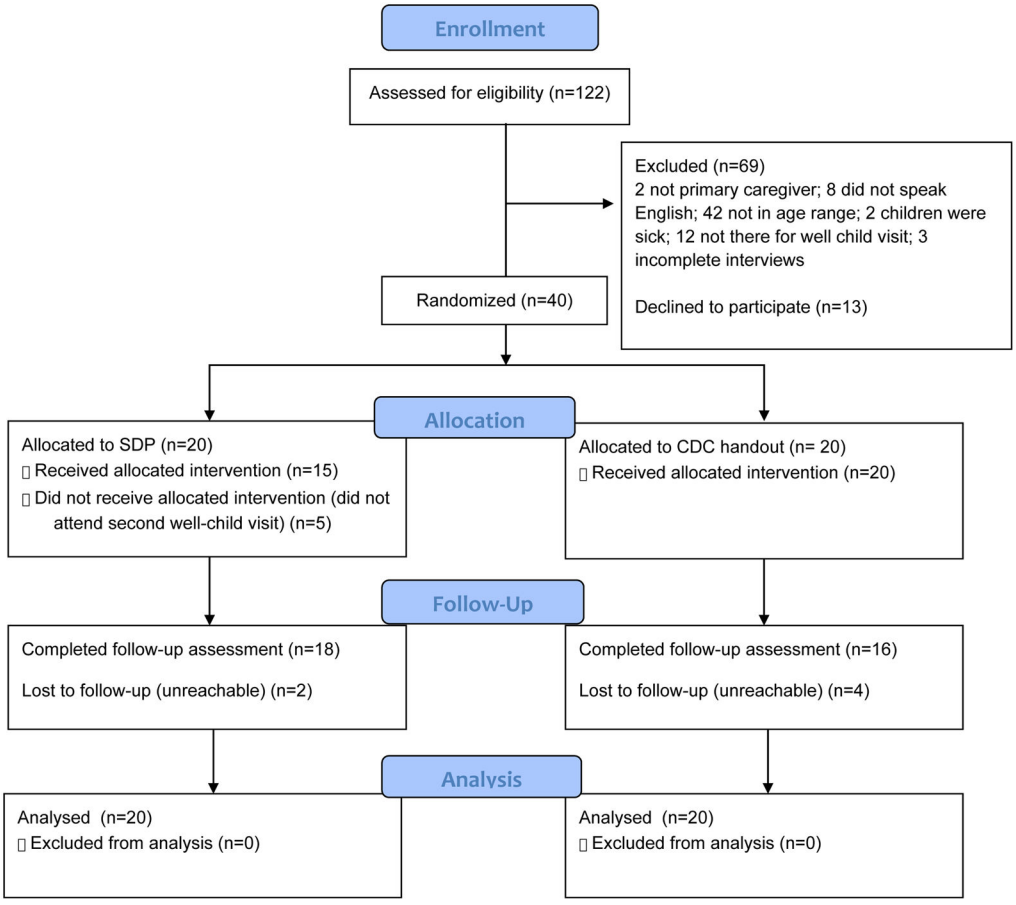

Figure 1.
Flow diagram of participation and enrollment

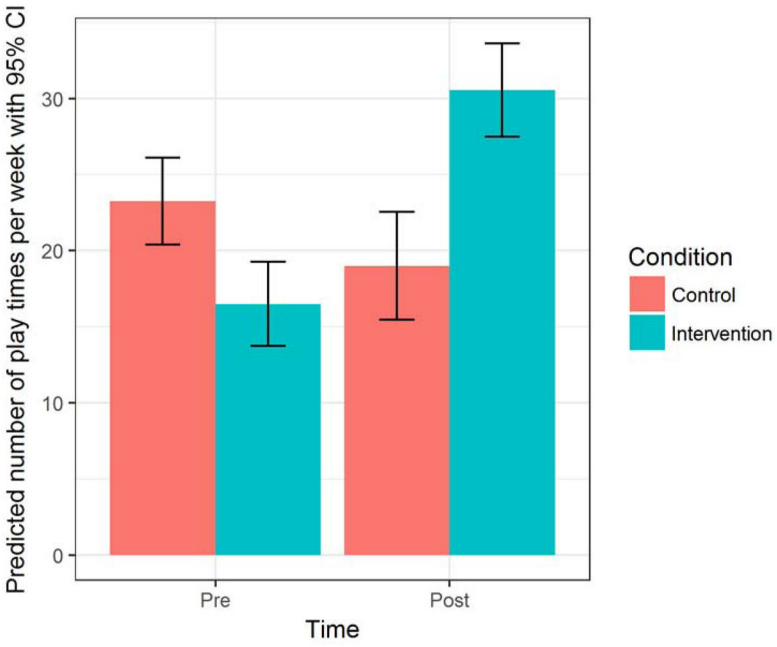

Figure 2.
Parental report of play by group

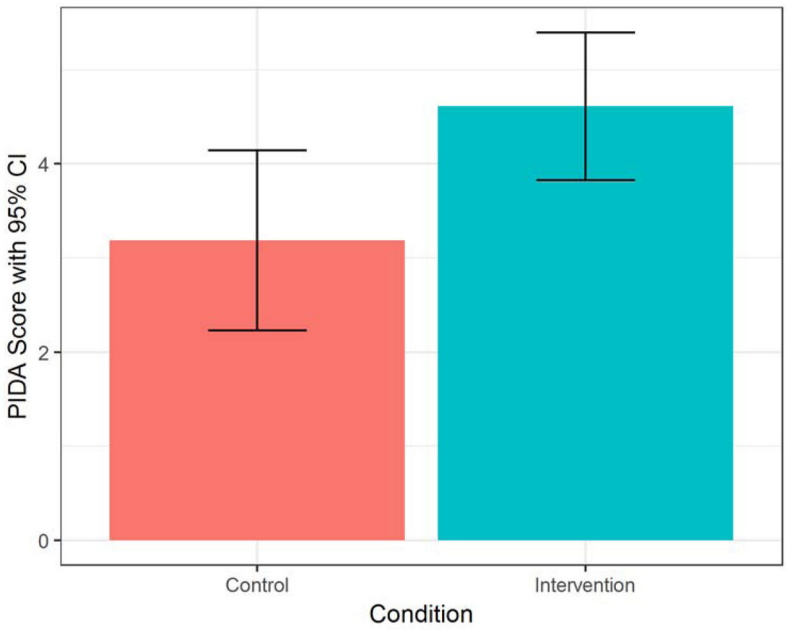

Figure 3.
Parental report of participation in cognitively stimulating activities by group

Table 1

Baseline Demographics of Sample

	SDP n = 20		Control n = 20	
	N	**%**	**N**	**%**
Child				
Gender (female)	13	65	7	35
Child Age				
2 months	6	30	11	55
3 months	0	0	0	0
4 months	9	45	4	20
5 months	2	10	1	5
6 months	3	15	4	20
First Born Child	7	35	12	60
Receives Public Health Insurance	15	75	15	75
Parent				
Gender (female)	19	95	18	90
Age				
18–20	1	5	2	20
21–25	4	20	5	25
26–30	5	25	7	35
31–35	6	30	4	20
36–40	4	20	1	5
41–45	0	0	0	0
46–50	0	0	1	5
Race/Ethnicity				
Asian	2	10	2	10
Black/African American	6	30	11	55
Latino/Hispanic	9	45	4	20
White/Caucasian	3	15	2	10
Pacific Islander	0	0	0	0
Other	0	0	1	5
Marital Status				
Single	10	50	14	70
Married	9	45	6	30
Separated, Divorced, or Widowed	1	5	0	0
Highest Education Level				

	SDP n = 20		Control n = 20	
	N	**%**	**N**	**%**
High School and Below	7	35	7	35
Some College	6	30	6	30
2-Year Degree	1	5	2	10
4-Year Degree	2	10	1	5
Graduate or Postgraduate Degree	4	20	4	20
Employment Status				
Employed (Full or Part-Time)	13	65	12	60
Unemployed	7	35	8	40
Annual Household Income				
< $25,000	5	25	8	44
$25,000–$39,999	9	45	1	6
$40,000–49,999	1	5	2	11
$50,000–74,999	2	10	3	7
$75,000–99,999	2	10	1	6
$100,000–$124,999	1	5	1	6
> $125,000	0	0	2	11

Note. Where data points were missing, percentages are calculated based on total number of available cases.

Table 2

Mixed linear model analysis of effects of *SDP* on parenting behaviors

	Number of Days of Play/Week	Number of Times of Play/Week	PSOC	ALM	PIDA	PVR
Intercept	5.7	23.3	75.1	3.88	3.19	5.06
Condition	0.05 (0.62)	−6.75 (6.41)	4.50 (3.14)	0.74^{+} (0.38)	1.42* (0.58)	1.77^{+} (0.90)
Time	0.59 (0.63)	−4.64 (6.00)	−0.71 (2.43)	-	-	-
Condition x Time	−0.03 (0.88)	18.4* (8.33)	−0.81 (3.36)	-	-	-

PSOC= Parenting sense of confidence; ALM=Availability of learning materials; PIDA= Parental involvement in developmental advancement; PVR= Parent verbal interactions. Cells are unstandardized regression coefficients and (standard errors).

* $p < .05$,

$^{+}$ $p < .10$