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Improving Child Self-Regulation and Parenting in Families of Pre-kindergarten Children with Developmental Disabilities and Behavioral Difficulties

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Abstract The transition to school may be particularly difficult for children with developmental disabilities and behavioral difficulties. Such children are likely to experience problems with self-regulation skills, which are critical to school adjustment. Additionally, inconsistent discipline practices and low parental involvement in children's schooling may contribute to a poor transition to school. This study employed a randomized clinical trial to examine the effects of a school readiness intervention that focused on children's self-regulation skills as well as parenting and parental involvement in school. Results showed that the intervention had positive effects on children's self-regulation in kindergarten as measured by teacher and observer reports. Additionally, the intervention significantly reduced ineffective parenting prior to school entry, which in turn affected parental involvement. This finding is significant because it demonstrates that parental involvement in school may be increased by efforts to improve parenting skills in general. Overall, the study demonstrated that school adjustment across kindergarten among children with developmental disabilities and behavioral difficulties can be enhanced through an intervention aimed specifically at improving school readiness skills.

Keywords School readiness · Self-regulation · Parenting · Parent involvement · Intervention

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Introduction

A successful transition into kindergarten is important to ongoing positive academic and social adjustment in school (Pianta and Cox 1999). This transition may be particularly difficult for children with developmental disabilities who also have behavioral difficulties (McIntyre et al. 2006), as this combination may lead to longer-term academic and social problems and greater use of special education services. Key to both behavioral difficulties and a poor kindergarten transition may be deficits in self-regulation (the abilities to control one's emotions, behaviors, and cognitive processes such as attention; Baker et al. 2007; Blair and Diamond 2008). These challenges may be compounded by less consistent, effective parental discipline, which has been linked to reduced child self-regulation and potentially less parental involvement in school (Hindman and Morrison 2012). The present study examined the effects of a school readiness intervention on children's self-regulatory abilities, parents' discipline, and parental involvement in school in families of children with developmental disabilities and behavioral difficulties.

Self-Regulation and School Readiness

Self-regulatory abilities are critical school readiness skills that help children to focus their attention, follow teacher directions even if they would prefer to be doing something else, and inhibit negative or aggressive responses during conflicts with peers (Blair and Diamond 2008). Self-regulatory abilities prior to kindergarten predict math and literacy achievement throughout the school years, as well as college completion (McClelland et al. 2012). There are relatively few studies of these skills in children with developmental disabilities. The extant research suggests that this subgroup of children show poorer self-regulation skills than their typically developing peers (Baker et al. 2007; Gerstein et al. 2011). Deficits in

these skills are particularly salient for children with behavior difficulties in addition to developmental disabilities or delays (Gerstein et al. 2011), given the central role of self-regulation in the development of behavior problems (Olson et al. 2005).

The importance of self-regulation skills for children with developmental disabilities and behavior difficulties suggests a particularly critical point of intervention to improve school adjustment. In school-aged children receiving special education services, interventions to increase such skills as emotion regulation have shown significant impacts on reducing behavior problems (Kam et al. 2004). Intervening even earlier (e.g., prior to school entry) might further prevent the development of behavioral and social difficulties.

Parenting, Parental Involvement, and School Readiness

In addition to the child's own self-regulation skills, parental behaviors are highly influential in promoting school readiness and school adjustment. Effective discipline skills, such as consistency in limit-setting and follow-through on consequences, contribute both to children's school readiness prior to kindergarten entry and better performance once in school (Hindman and Morrison 2012). Further, intervention-related improvements in parents' use of effective discipline strategies are associated with long-term positive academic outcomes for their children (Zhou et al. 2008). Additional research has documented the importance of parental involvement both in schoolwork completion and in school activities to children's positive school adjustment, including higher rates of graduation and better educational attainment (Pomerantz et al. 2007).

The association between parenting skills early in a child's life and parental involvement once the child enters school has been less well explored. It is plausible that parents who are less consistent in their parenting might be less involved in their children's schooling. In studies of children already enrolled in school, parenting characterized by low levels of monitoring, limit-setting, and support was associated with the lowest levels of parental involvement in school (Blondal and Adalbjarnardottir 2009). The potential association between parenting skills and involvement may be particularly important for efforts to increase school involvement in high-risk parents. While it is not well understood how to positively influence such involvement (Pomerantz et al. 2007), there is a fairly robust literature documenting evidence-based practices to improve parenting skills (Eyberg et al. 2008). Thus, if a link between parenting skills and involvement can be demonstrated, improving parenting skills might be an effective way to increase parental involvement in schooling for high-risk families.

Effective parenting *and* school involvement may be particularly important for parents of children with developmental disabilities and behavioral difficulties, who may exhibit inconsistent parenting practices (Baker et al. 2003). This may be partially due to a transactional process in which children's behavioral difficulties increase levels of parental stress, which may then interfere with parents' abilities to utilize consistent, effective discipline strategies, further exacerbating children's behavioral problems (Baker et al. 2003). Additionally, as is mentioned above, poor parenting might lead to less parental involvement in school. This may be especially problematic for these families for two reasons. First, parental involvement may already be negatively affected by the child's behavioral problems (Benson et al. 2008) and parenting difficulties could further decrease this involvement. Second, parental involvement in school appears to be particularly influential for the academic achievement of students with developmental disabilities (Zhang et al. 2011). Thus promoting parental involvement both directly and indirectly, through fostering more effective parenting skills, might be particularly impactful for their children's school adjustment.

Improving School Readiness and Parenting for Children with Developmental Disabilities and Behavior Difficulties

Given their importance to school adjustment outcomes, child self-regulatory skills and consistent, effective parenting skills may be early, malleable targets for efforts to improve school readiness and subsequent school adjustment in children with co-occurring developmental disabilities and behavioral difficulties. Although children with developmental disabilities are eligible to receive early childhood special education (ECSE) services, such programs may not focus on these skills in relation to the transition to school. For example, services may include intervention to increase self-regulatory skills (McClure et al. 2009), but these may not comprise the classroom-related self-regulatory abilities (e.g., following directions, working independently) that teachers identify as being lacking in many incoming kindergartners (Rimm-Kaufman et al. 2000). Similarly, although parent involvement is a goal of ECSE services (Gargiulo and Kilgo 2011), such efforts may largely focus on having the parent attend meetings about service provision decisions, rather than specifically on how the parent can become involved in the children's preparation for and participation in school. Training on how parents can effectively influence their children's behavior over this transition may be particularly important, as children with developmental disabilities have more behavior problems than their typically developing peers over the transition (McIntyre et al. 2006). Programs that include both child and parent components for typically developing children with behavior problems and other risks have shown positive results (Brotman et al. 2011; Webster-Stratton and Reid 2003).

Finally, many ECSE programs run on an academic calendar. Thus, they may leave a "summer services gap" before the transition to school during which high-risk students may lose skills or fail to gain skills at the same rate as their peers

(Alexander et al. 2001). Additionally, during this gap, parents of children with developmental disabilities may experience increased stress (McFayden and Hughes 1996) and potential decrements in parenting skills.

Bridging the Kindergarten Transition: the Kids in Transition to School Program

The Kids In Transition to School (KITS) Program (Pears et al. 2013) is a short-term, intensive school readiness intervention designed to augment the early literacy, social, and self-regulation skills of children at high risk for difficulties with academic and social adjustment. KITS was specifically designed to be delivered during the summer before the transition to kindergarten (the school readiness phase) and the first 2 months of kindergarten (the transition/maintenance phase). The *developmental timing* of the program is a key feature. Pianta and Cox (1999) argued that the start of kindergarten may be optimal for intervention because children and families may be particularly open to influence as they are in the process of reorganizing their competencies, and this transition may set the child's school trajectory.

Another important feature of the KITS Program is its *focus on self-regulatory skills* in addition to foci on early literacy and social skills. Participating children receive explicit instruction to increase skills and parents receive training on how to help develop their children's skills. In addition, the KITS Program includes a *parent component* focused both on helping parents learn positive, effective skills for managing their children's behavior and on helping parents to promote school readiness at home and become involved in their children's schooling.

Results from a randomized evaluation of KITS with children in foster care, a population with high rates of developmental disabilities and high risk for school failure (Scherr 2007), demonstrated that the children who received the KITS intervention showed significant improvements in their self-regulation skills across the summer before kindergarten (Pears et al. 2013). Further, these effects were sustained as the children showed less disruptive behavior at the end of the kindergarten year (Pears et al. 2012).

The current study presents findings from a second randomized efficacy trial of the KITS Program—this time with children with documented developmental disabilities who also had behavioral difficulties. The study had three goals. The first was to examine immediate (i.e., just prior to the start of kindergarten) effects of the intervention on the self-regulatory skills of children. The second was to examine immediate intervention effects on ineffective parenting. The third was to examine the longer-term (i.e., at the end of kindergarten) effects of the intervention on children's self-regulation and parents' involvement in school. We hypothesized that there would be significant immediate intervention effects on both child self-regulatory skills and ineffective parenting, controlling for prior skills. Additionally, we hypothesized that the intervention would positively influence longer-term self-regulation skills directly as well as indirectly through effects on self-regulation prior to the start of school. We also predicted positive intervention effects on parental involvement in kindergarten directly as well as indirectly through reductions in ineffective parenting skills prior to the kindergarten transition.

Methods

Participants

Two hundred and nine children and their families were recruited in four yearly cohorts of 50–55 through the county public agency responsible for ECSE services for young children. To be eligible for study participation, the child had to be transitioning to kindergarten, to have a documented developmental disability that made them eligible to receive ECSE services, and to have behavioral difficulties as assessed by the children's ECSE service coordinators. The child's *behavioral difficulties score* was a combination of the service coordinator's initial rating of the child as having behavioral, social, and/or attentional difficulties that would interfere with his or her adjustment to kindergarten (scored "1" if the child had such difficulties) combined with the total number of subscales for which the child exceeded the clinical cutoff score on the 16-item Critical Events scale, the 9-item Aggressive Behavior scale, and the 9-item Maladaptive Behaviors scale of the Early Screening Project (ESP; Walker et al. 1995). The ESP is an empirically based screening measure for significant behavior problems in 3- to 6-year-olds.

Exclusion criteria for the study included the child having hearing or vision impairments that would limit participation, IQ below 70, not being a monolingual or bilingual English speaker, being in a foster placement (due to the separate randomized trial of KITS with children in foster care), or receiving full-time ECSE services in the summer. This last criterion was added because most of these families opted for the ECSE services over the KITS Program and because the KITS Program is designed to fill a summer services gap.

A total of 392 families were initially identified as eligible to participate in the study. Of these, 18 were subsequently found to be ineligible when contacted for recruitment. Of the remaining 374 families, 225 (60 %) agreed to participate and were randomized. There were no significant differences on child gender, age, ethnicity, disability diagnosis, or the behavioral difficulties score between the families who agreed to participate and those who chose not to participate or respond.

Sixteen of the 225 families dropped out of the study before they completed any of the assessments, leaving 209 participating families (107 randomized to the KITS intervention and

102 to the services-as-usual [SAU] group). The families who dropped out of the study were not significantly different than the 209 who participated, and the KITS and SAU groups did not differ significantly in overall attrition rates. There were no significant differences between the two groups of participating families in demographic characteristics (Table 1). A larger proportion of boys in the sample was expected given the focus on behavioral difficulties.

Study Design and Procedures

Data Collection Procedures The children and their parents completed a 1- to 1.5-h assessment at the beginning of the summer before the start of any intervention activities (time 1 [T1]), at the end of the school readiness phase of the intervention just prior to the start of school (time 2 [T2]), and at the end of the kindergarten year (time 4 [T4]) (Time 3 occurred in the fall of kindergarten and included assessments not used in this paper). Children completed standardized tests, and parents completed semi-structured interviews and questionnaires. In the spring of the kindergarten year (T4), observers rated the child's behavior during 15 min each of structured and unstructured time on two different days separated by a week. Teachers completed questionnaires about the children's behaviors and the parents' involvement in school. Assessors, observers, and teachers were blind to the group assignment of each family.

Intervention Protocol The KITS intervention occurs during the 2 months prior to kindergarten entry (school readiness phase) and the first 2 months of kindergarten (transition/maintenance phase). The intervention consists of two primary components: a 24-session school readiness group for the children (2 h, twice weekly in the school readiness phase, 16 sessions; 2 h, once weekly in the transition/maintenance phase, 8 sessions) focused on promoting early literacy, social and, self-regulatory skills, and an 8-session parent group (2 h, every 2 weeks; 4 sessions in each intervention phase) focused on effective parenting techniques as well as promoting caregiver involvement in early literacy and school.

School Readiness Group Structure and Curriculum The KITS school readiness group sessions are held in center- or school-based classrooms and have a highly structured, consistent routine similar to a typical kindergarten classroom. The manualized curriculum covers three critical skill areas: *early literacy skills* (e.g., letter names, phonological awareness, conventions of print, and comprehension), *prosocial skills* (e.g., reciprocal social interaction, social problem-solving, and emotion recognition), and *self-regulatory skills* (e.g., handling frustration and disappointment, paying attention, following multistep directions, and making appropriate transitions). The curricular objectives for each skill domain and the activities to promote these skills are clearly specified for each session. Self-regulatory and prosocial skills are taught using a blend of instruction (e.g., teachers define *sharing*, and provide verbal examples), role-playing (e.g., teachers model sharing and not sharing), and activity-based intervention (e.g., children must share materials to complete an art project); the children receive high rates of encouragement, feedback, and guided practice in using the target skills. Multiple opportunities for using inhibitory control, maintaining attentional focus, and practicing skills are embedded across activities. A graduate-level lead teacher and two assistant teachers conduct the school readiness groups with 12–15 children.

Parent Group Structure and Curriculum KITS parent group meetings coincide with the children's school readiness group meeting times. Each group is led by a facilitator and an assistant. The manualized curriculum includes foci on parenting skills (e.g., evidence-based behavior management techniques that parallel those used in the school readiness groups) and parent involvement in preparing for school (e.g., helping children to develop their early literacy skills, developing routines around school activities, and becoming involved at school). The facilitator presents information, leads structured group discussions, facilitates parent-to-parent support, and addresses questions and concerns. Skill acquisition is reinforced via role plays and opportunities to practice new skills. Supplemental materials to support the implementation of new skills include weekly homework assignments to complete together, weekly *Home–School Connection* newsletters outlining the school readiness group topics for a given week, and home practice activities. A caregiver who misses a session receives a home visit (or a phone call if necessary) from the facilitator to cover the content and materials for that session.

The KITS school readiness group teachers and caregiver group facilitators complete a standardized 35- to 40-h training program. At weekly intervention team meetings, the progress of individual children and families within the three school readiness domains is discussed, and strategies to address children's behavioral and literacy needs and parents' engagement within the broader curriculum are planned.

Fidelity of Implementation For both the school readiness groups and the parent groups, trained coders noted the presence or absence of elements of the curricula either in vivo or via videotape. On average across all sessions, 98 % of the components were covered for the school readiness playgroups and 92 % for the parent groups. Additionally, coders rated whether the teachers and parent group facilitators appropriately implemented key behavior or group management strategies (e.g., "pre-taught expectations," for the school readiness groups and "engaged parents in conversation," "redirected conversations when necessary" for the parent groups) on a 3-point scale: 1 "did not occur", 2 "sometimes occurred", and 3 "regularly occurred". Teachers received an average rating of

Table 1 Demographic characteristics of the KITS and SAU groups

	KITS group	SAU group
Mean child age in years	5.26 (0.29)	5.28 (0.28)
Child sex (% male)	77	77
Child ethnicity (%)		
European American	71	67
Latino	14	14
African American	1	2
Native American	1	2
Asian American	1	1
Mixed race	12	14
Child disability category (%)		
Developmental delay	61	58
Communication delay	29	32
Autism	9	10
Orthopedic impairment	1	0
Caregiver sex (% female)	94	91
Relationship of caregiver to child (%)		
Biological parent	94	86
Step or adoptive parent or other relative	6	14
Caregiver marital status (%)		
Married	44	51
Divorced, separated, or widowed	29	25
Never married	27	24
Median caregiver education	<4 years of 4-year-college	<1 year of 4-year-college
Median annual household income	$25,000–29,999	$25,000–29,999

Values in the parentheses represent standard deviations

2.94 and the parent group facilitators a rating of 2.85, indicating that they used the management strategies regularly.

Attendance We tracked school readiness group attendance, parent group attendance, and home visits (or phone calls). On average, the children attended 62 % of the school readiness groups, and the majority (60 %) attended 60 % or more. These rates are comparable to those reported for other summer programs for high-risk children (August et al. 2003). For parent attendance, the primary variable of interest is the amount of curriculum received. On average, parents received 54 % of the curriculum, and the majority (52 %) received 60 % or more. These rates are comparable to other studies of short-term parenting interventions for high-risk samples (e.g., Begle et al. 2012).

Services-as-Usual Comparison Group Children in this group received the services that are typically offered to children identified as having developmental disabilities, including early childhood special education services and evaluation, individual and family therapy, and participation in early childhood education and care programs. No attempt was made to influence the type or amount of services given to the children and their families.

Measures

Self-Regulation at T1 and T2 This was measured using several parent-report indicators. For the first, two subscales of the Child Behavior Checklist (CBCL; Achenbach 1991) were used to form a composite of behavioral regulation: Attention Problems (α=.81 and .80 at T1 and T2, respectively; all alphas reported here are standardized) and Aggressive Behavior (α=.89 and .88 at T1 and T2, respectively). Both subscales were positively associated (T1 r=.62, p<.001; T2 r=.65, p<.001) so scores were averaged at each timepoint. Second, the reversed score on the Lability subscale of the Emotion Regulation Checklist (ERC; Shields and Cicchetti 1997) was used (α=.85 and .87 at T1 and T2, respectively). Lastly, the reversed score on the Emotion Control subscale of the Behavior Rating Inventory of Executive Function-Preschool Parent Report (BRIEF-P; Gioia et al. 2000) was used (α=.89 and .90 at T1 and T2, respectively). Higher scores indicated poorer self-regulation. These three indicators comprised the latent factor for poor self-regulation at T1 and T2.

Ineffective Parenting at T1 and T2 This variable was measured at T1 and T2 by averaging the standardized scores of

two scales (T1 r=.56, p<.001; T2 r=.58, p<.001). The Poor Discipline Implementation subscale of the Discipline Questionnaire (OSLC; α=.71 and .69 at T1 and T2, respectively) includes items such as, "How often do you let your child get away with things that you feel should have been punished?", and the Laxness subscale of the Parenting Scale (Arnold et al. 1993; α=.82 at both T1 and T2) includes items such as, "When I say my child can't do something, I let my child do it anyway."

Self-Regulation at T4 At the end of kindergarten, self-regulation was measured using a composite score of three indicators. Observers rated children's behavior during structured classroom time using a scale of six items from the Social Competence Scale (Conduct Problems Prevention Research Group 1990) reflecting behavioral and emotional regulation (e.g., "Thinks before acting" and "Can calm down when excited or all wound up"). Scales from the two observation sessions (α=.76 and .81, respectively) were correlated (r=.67, p<.001), and thus standardized and averaged to form a single indicator. The second indicator was the teacher-completed Emotion Regulation subscale of the ERC (α=.81), and the third was the Self Control subscale the Social Skills Rating System-Teacher Form (Gresham and Elliot 1990; α=.86). These three indicators were standardized and averaged to produce one kindergarten self-regulation score (α=.58). Higher scores reflect better self-regulation.

Parental Involvement in School at T4 This variable was the average of the standardized total scores from parent and teacher reports on the Parent and Teacher Involvement Scale (Corrigan 2002; r=.38, p<.001). The total score for parent-reported school involvement (α=.87) included 26 items describing relationship quality, involvement, endorsement of school, and frequency of contact. The total score for teacher-reported parent involvement (α=.88) included 21 items describing parent endorsement of school, parent involvement, and frequency of contact.

Intervention Status In these analyses, intervention status was represented by a dichotomous variable: 1 (*KITS intervention group*) or 0 (*SAU group*).

Control Variables To account for general cognitive delays, the sum of the scaled scores for the Block Design and Vocabulary subscales of the Wechsler Preschool and Primary Scales of Intelligence-Third Edition (WPPSI-III; Wechsler 2002) at T1 were used to estimate a full scale IQ or *general cognitive ability* (Sattler and Dumont 2004). The behavioral difficulties score (described above) was used to control for the possibility that more severe behavioral difficulties might contribute to poorer self-regulation.

Data Analysis

First, we examined potential group differences on the indicators of the outcome variables at T1. Second, the correlations among the variables were examined. Third, SEM using Mplus version 7 (Muthén and Muthén 1998–2012) was employed to test the direct effects of the KITS Program on T2 self-regulation and parenting skills as well as direct and indirect effects of the intervention on T4 child self-regulation and parent involvement. Clustering effects were addressed by specifying a complex two-level model, which adjusted the chi-square estimates and standard errors to account for non-independence of observations due to sampling within schools and modeled the non-independence due to sampling within teachers at the second level. Specifically, a model including a latent variable represented by three indicators of poor child self-regulation and a composite score representing ineffective parenting at both T1 and T2 were fit to the data to confirm the adequacy of the hypothesized indicators. Next, the direct effects of the covariates on the T1 outcome, the direct effect of intervention status on the T2 outcomes, and the direct and indirect effects of intervention status on T4 outcomes were modeled. Additionally, the significance of indirect paths from the intervention to T4 self-regulation skills through T2 self-regulation and from the intervention to T4 parental involvement through T2 ineffective parenting skills were tested using Mplus version 7. These tests accommodate paths involving multiple variables, estimating the significance of the total effect of the entire path.

Complete data were available on all control variables; 2.4, 2.9, and 2.4 % of the sample were missing data on one or more of the indicators at T1, T2, and T4, respectively. The Little's Missing Completely at Random test was not significant for the model (χ^2=70.84, df=60, p=.16) indicating a random distribution of the missing data. Full information maximum likelihood estimation (FIML) utilized all of the available data for model estimation.

Results

Descriptive Analyses

We first examined the mean scores for the children and parents on the indicators and composite variables (Table 2). There were no significant differences between the groups on the measures at T1. Additionally, the correlations between the T1, T2, and T4 measures and control variables were examined (Table 3). There were significant positive correlations between the indicators of poor self-regulation within timepoints at T1 and T2 as well as across T1 and T2. Self-regulation at T4 was negatively associated with only two of the indicators of poor self-regulation at T2, Lability and Poor Emotion Control, and

Table 2 Means and standard deviations for the indicator and control variables by group

	KITS Group						SAU Group					
	T1		T2		T4		T1		T2		T4	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Attention and Aggression	.07	.97	.03	.93	–	–	−.07	.82	−.03	.89	–	–
Lability	2.06	.50	1.97	.50	–	–	2.00	.43	1.96	.47	–	–
Poor Emotion Control	17.68	4.93	16.61	4.77	–	–	16.73	4.58	16.59	4.81	–	–
Ineffective parenting	.02	.91	−.07	.88	–	–	−.02	.86	.07	.90	–	–
Self regulation in school					.10	.72					−.11	.79
Parent involvement in school					.05	.84					−.05	.86
General cognitive ability	87.99	15.58					89.85	16.16				
Behavioral Difficulties score	2.34	1.13					2.34	1.14				

was not associated with any of the T1 measures. The measures of ineffective parenting at T1 and T2 were significantly positively correlated. Ineffective parenting at T1 was significantly associated with all of the measures of poor self-regulation at T1. Ineffective parenting at T2 was significantly associated with T2 Attention Problems/Aggression and Lability but not with T2 Poor Emotion Control. Ineffective parenting at both T1 and T2 were negatively associated with parental involvement at T4. Interestingly, the children's scores on the WPPSI-III Block Design and Vocabulary subscales, used here to measure general cognitive ability, were only significantly associated with parental involvement at T4. Finally, the behavioral difficulties score was associated with most of the measures of self-regulation with the exception of Poor Emotion Control at T1.

Intervention Effects on Child Self-Regulation, Parenting, and Parental Involvement

In the SEM analysis, at T1 and T2, the CBCL Attention Problems/Aggression indicator, the ERC Lability score, and the BRIEF-P Poor Emotion Control subscale were used as indicators of a latent variable. The composite score for ineffective parenting was utilized at T1 and T2. The T4 outcomes were the composites of observer- and teacher-rated self-regulation and parent- and teacher-reported parental involvement in school.

Children were clustered within 131 teachers within 79 schools. Clusters of students within teachers ranged in size from 1 (n=85) to 7 (n=1), with an average size of 1.6. At the teacher level, intraclass correlations (ICCs) estimated in Mplus for all variables in the model were .22 or below, with the exception of the T2 Lability subscale of the ERC, which had an ICC of .36.

This model (Fig. 1) showed acceptable fit indices, χ^2= 47.86, df=55, p=.74, CFI=1.00, TLI=1.00, RMSEA=0.00. All of the indicators of poor self-regulation at T1 and T2 loaded significantly on their respective latent variables. As predicted, there was a significant effect of the KITS intervention on T2 ineffective parenting; the intervention was associated with lower levels of ineffective parenting. The effect size for this path was computed using the formula for the independent-groups pretest–posttest design (Feingold 2009): $d=(M_{\text{change-KITS}}/\text{SD}_{\text{raw(pre-KITS)}})-(M_{\text{change-SAU}}/\text{SD}_{\text{raw(pre-SAU)}})$, where $M_{\text{change-KITS}}$ is the mean change for the KITS group, $M_{\text{change-SAU}}$ is the mean change for the SAU group, $\text{SD}_{\text{raw(pre-KITS)}}$ is the pretest SD for the KITS group, and $\text{SD}_{\text{raw(pre-SAU)}}$ is the pretest SD for the SAU group. This yielded a d of .21, denoting a decline in ineffective parenting for the treatment group. The intervention effect on T2 poor self-regulation was not statistically significant.

It was hypothesized that the intervention would be associated with higher levels of parent involvement at the end of kindergarten directly and indirectly through decreased ineffective parenting at T2. The intervention was significantly negatively associated with ineffective parenting at T2, and ineffective parenting at T2 was in turn negatively associated with parent involvement in school at T4. This indirect path from the intervention to parent involvement in kindergarten was significant (z=2.00, p=.045; standardized estimate=.03, 95 % confidence interval=.001–.06). We also hypothesized that there would be direct and indirect effects of the intervention on self-regulation at T4. There was a significant, direct, positive treatment effect on the child's self-regulation at T4. The effect size for this path was computed using the formula for differences between the means of two groups at a single time point (Cohen 1988): $d=(M1-M2)/\text{SD}_{(\text{pooled})}$ where $\text{SD}_{(\text{pooled})}=\sqrt{[(\text{SD1}^2+\text{SD2}^2)/2]}$ and yielded a d of .29. There were no significant indirect effects. Turning to the covariates, the child's behavioral difficulties score at T1 was positively associated with T1 poor self-regulation.

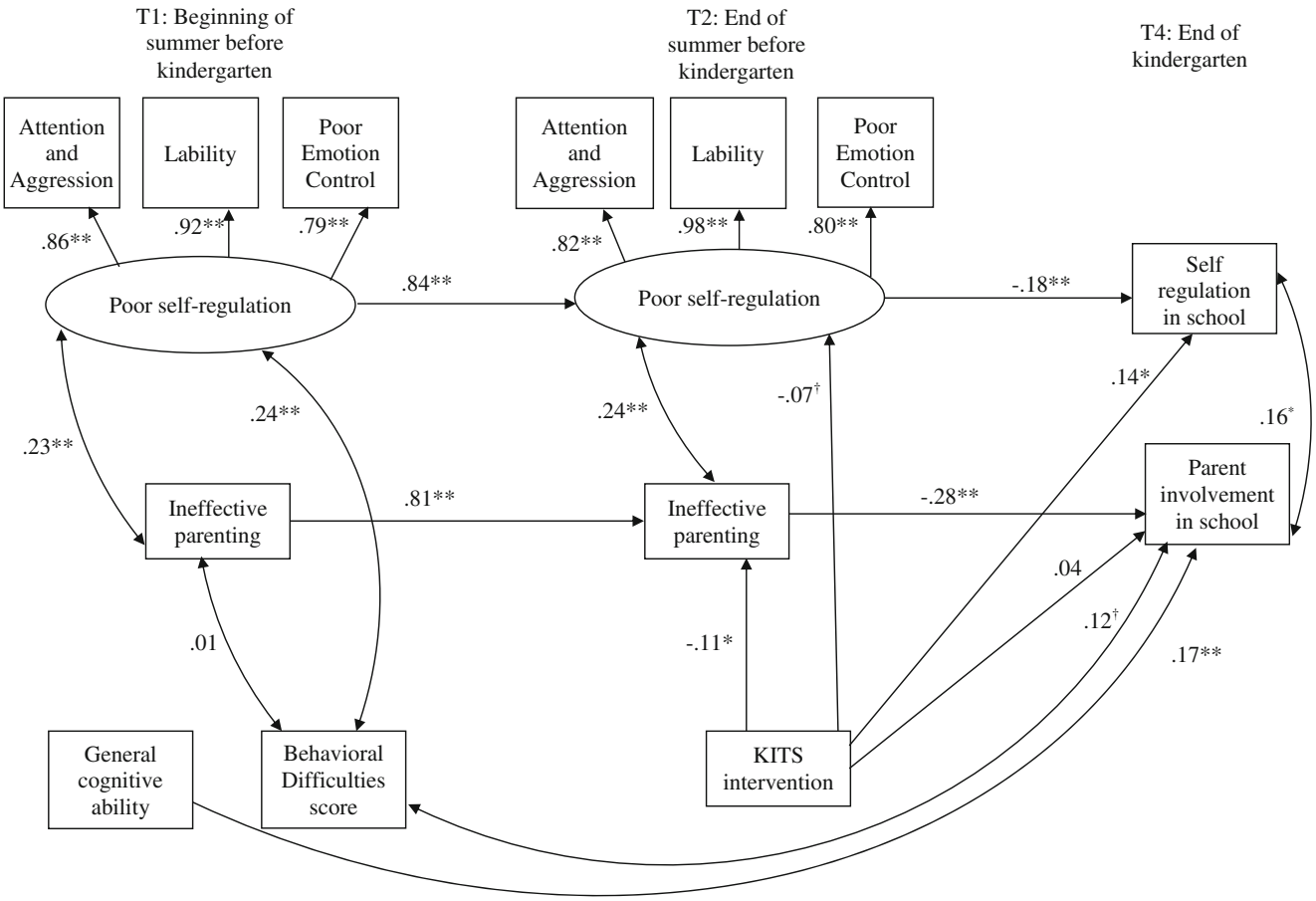
Table 3 Correlations among the indicator variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. T1 Attention and Aggression	–											
2. T1 Lability	.79**	–										
3. T1 Poor Emotion Control	.66**	.71**	–									
4. T1 ineffective parenting	.21**	.19*	.17*	–								
5. T2 Attention and Aggression	.79**	.68**	.54**	.11	–							
6. T2 Lability	.71**	.76**	.67**	.16*	.79**	–						
7. T2 Poor Emotion Control	.57**	.59**	.76**	.05	.67**	.78**	–					
8. T2 ineffective parenting	.18*	.15*	.14	.81**	.16*	.21**	.12	–				
9. T4 self regulation in school	−.12	−.10	−.04	.02	−.12	−.15*	−.15*	.06	–			
10. T4 parent involvement in school	−.08	−.04	.01	−.22**	−.07	.01	.04	−.25**	.14*	–		
11. General cognitive ability	−.06	−.10	−.01	−.13	−.07	−.10	.01	−.07	.11	.19*	–	
12. Behavioral Difficulties score	.27**	.23**	.13	.01	.24**	.21**	.18*	.03	−.16*	.07	−.07	–

*p<.05; **p<.01

Discussion

Children with developmental disabilities and behavioral difficulties are at risk for poor kindergarten transitions (McIntyre et al. 2006), which may set children on long-term negative academic and social trajectories. Interventions focused on supporting children and their parents across the kindergarten transition may help to increase opportunities for a successful



Note: Additional free error covariances are not pictured in the model
† p < .10; *p < .05; ** p < .01

Fig. 1 Effects of the intervention on child self-regulation, ineffective parenting, and parental involvement in kindergarten

start of school and continuing positive academic and social adjustment. Recently, researchers have noted the need to study longer-term effects of programming for children with developmental disabilities that is targeted at the transition to kindergarten to determine if such interventions improve school adjustment (McIntyre et al. 2010). The present study shows that interventions can have positive effects on these children and their parents. Importantly, the study also demonstrated that immediate effects on school readiness translated into effects on outcomes at the end of kindergarten.

The KITS Program includes specific foci on school-related self-regulatory skills (e.g., waiting to be acknowledged before speaking) as well as more general behavioral and emotion regulation skills (e.g., handling disappointment). Our hypothesis that the KITS Program would have positive direct and indirect effects on self-regulation at the end of kindergarten was partially supported. There was a significant positive direct effect of the intervention on children's self-regulation at the end of kindergarten, although significant changes in this domain were not observed immediately pre-kindergarten. This suggests that intervention effects on self-regulation might take longer to emerge than the 2 months of summer for this population of children. Alternatively, it may be that the positive intervention effects on parenting had to become more solidified before changes in child behavior could become reliably apparent as shown in other studies of long-term effects of parenting interventions (Zhou et al. 2008). The malleability of this skill even at the age of 4 to 5 years old was expected given that the prefrontal cortex, the brain region implicated in many specific executive functions and self-regulation more generally, has a protracted period of development, extending into adolescence (Durston et al. 2002).

Parents of children with developmental disabilities and behavioral difficulties are likely to experience stresses that may impinge on their parenting skills (Fenning et al. 2007). Deficits in parenting skills may then negatively affect the parents' abilities to prepare children for and become involved in school. By addressing both parenting skills and involvement, the KITS Program aims to improve children's school readiness and subsequent adjustment. In this study, the intervention reduced ineffective parenting, as indexed by inconsistency and laxness in discipline, across the summer before school entry.

As is noted above, parent involvement in school may be particularly important in promoting academic achievement for children with developmental disabilities (Zhang et al. 2011) but research to date has not identified specific approaches that can increase parental involvement in families with high-risk children (Pomerantz et al. 2007). This study identified an important potential pathway for impacting these domains—i.e., by reducing ineffective parenting, the intervention significantly improved parents' involvement in kindergarten. This finding points to the importance of timing, as teaching parents skills to aid children with the kindergarten transition may also encourage greater participation in that transition and thereafter.

In the present study, effect sizes for significant direct intervention effects ranged from .21 for changes in parenting across the summer to .29 for intervention effects on self-regulation at the end of kindergarten. Although these may be considered relatively "small" effects (Cohen 1988), the intervention effect sizes in this study are comparable to average effect sizes found in recent meta-analyses of educational interventions (.20 to .30) and most particularly to the median effect size of .19 found in a meta-analysis specific to summer interventions for general and high-risk students (Cooper et al. 2000).

From a prevention standpoint, it is also important to examine intervention effects on the numbers of children and parents scoring in the clinical range for indicators of behavioral or parenting difficulties. In the present study, we examined the indicators of poor self-regulation and parenting for which there were published cutoff scores to determine if the percentages of children and parents scoring in the clinical ranges from T1 to T2 decreased. These indicators were the Attention Problems and Aggressive Behavior subscales of the CBCL, the Emotion Control subscale of the BRIEF-P, and the Laxness subscale of the Parenting Scale. For the CBCL Attention Problems and Aggressive Behavior subscales, in the KITS group, there were 6 and 2 %, respectively, greater decreases in the number of children in the clinical range (T score greater than 70) from T1 to T2 (change scores=−3.7 and −5.6 %, respectively) than in the SAU group (change scores=2.0 and −3.9 %, respectively). For the Emotion Control subscale of the BRIEF-P, the decrease in the numbers of children in the clinical range (T score of 65 or greater) was 14 % for the KITS group vs. 0 % for the SAU group. Finally, in the KITS group (change score=−9.3 %), there was an 8 % greater decrease in the numbers of parents in the clinical range for Laxness (mean of 3.2 or above) than in the SAU group (change score=−1.0 %). Overall, although the differences were not statistically significant at the $p<.05$ level, the KITS intervention was associated with greater decreases in the numbers of children and parents showing clinically significant poor self-regulation or ineffective parenting.

Despite overall positive results, some study limitations should be noted. First, rather than representing a single specific disability or delay, the children were representative of the heterogeneity in the population of children receiving ECSE services (Scarborough et al. 2011). This precluded analyses of intervention effects by disability type. Additionally, because the sample represented children who had behavioral difficulties as well, the results may not be generalizable to the entire population of children with developmental disabilities. However, as noted above, because of deficits in self-regulation and the likelihood that parents may have problems with effective

parenting, this group may be most at risk for difficulties in school; thus, these families represent an important focus for interventions.

Second, our measures of parenting included self-report questionnaires. Thus, informant bias is a possibility as the parents were aware whether they were in the intervention. However, the measure of parent involvement, on which there were significant indirect effects of the intervention, was based on both parent and teacher report, and teachers were blind to families' intervention statuses. Future studies could include observational measures of parenting.

Third, one of the measures of parental inconsistency was the Laxness scale of the Parenting Scale. Although the scale does measure whether parents use effective discipline, it could be argued that the scale taps into whether parents fail to consistently use effective discipline rather than whether they are inconsistent in their parenting. The other measure of inconsistent discipline may have been stronger. Future studies might use multiple strong measures of consistency.

Finally, although parents received at least half of the curriculum on average and most received 60 % or more, there were parents who either participated at low rates or not at all. In the current study, we offered child care, refreshments, stipends for mileage, evening classes, and home visits to encourage parental participation. Future research should focus on whether parent or child characteristics predict level of and further strategies to encourage participation.

Overall, this study has demonstrated that it is possible to improve the school readiness skills of children with developmental disabilities and behavioral difficulties. Additionally, parenting skills can be improved and this positively impacts parental involvement in school, which may in turn increase children's adjustment across their school years. Thus, a relatively short-term but specifically targeted intervention has the potential to improve the longer-term school outcomes for a very high-risk group of children.

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References

Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington: University of Vermont.

Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2001). Schools, achievement, and inequality: A seasonal perspective. *Educational Evaluation and Policy Analysis, 23*, 171–191. doi:10.3102/01623737023002171.

Arnold, D. S., O'Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment, 5*, 137–144. doi:10.1037/1040-3590.5.2.137.

August, G. J., Lee, S. S., Bloomquist, M. L., Realmuto, G. M., & Hektner, J. M. (2003). Dissemination of an evidence-based prevention innovation for aggressive children living in culturally diverse, urban neighborhoods: The *Early Risers* effectiveness study. *Prevention Science, 4*, 271–286.

Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: Behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research, 47*, 217–230. doi:10.1046/j.1365-2788.2003.00484.x.

Baker, J. K., Fenning, R. M., Crnic, K. A., Baker, B. L., & Blacher, J. (2007). Prediction of social skills in 6-year-old children with and without developmental delays: Contributions of early regulation and maternal scaffolding. *American Journal of Mental Retardation, 112*, 375–391. doi:10.1352/0895-8017(2007)112[0375:POSSIY]2.0.CO;2.

Begle, A. M., Lopez, C., Cappa, K., Dumas, J. E., & de Arellano, M. A. (2012). Ethnicity differences in child and parental outcomes following involvement the PACE program. *Behaviour Research and Therapy, 50*, 56–65. doi:10.1016/j.brat.2011.09.009.

Benson, P., Karlof, K. L., & Siperstein, G. N. (2008). Maternal involvement in the education of young children with autism spectrum disorders. *Autism, 12*, 47–63. doi:10.1177/1362361307085269.

Blair, C., & Diamond, A. (2008). Biological processes in prevention and intervention: The promotion of self-regulation as a means of preventing school failure. *Development and Psychopathology, 20*, 899–911. doi:10.1017/S0954579408000436.

Blondal, K. S., & Adalbjarnardottir, S. (2009). Parenting practices and school dropout: A longitudinal study. *Adolescence, 44*, 729–749.

Brotman, L. M., Calzada, E., Huang, K.-Y., Kingston, S., Dawson-McClure, S., Kamboukos, D., et al. (2011). Promoting effective parenting practices and preventing child behavior problems in school among ethnically diverse families from underserved, urban communities. *Child Development, 82*, 258–276. doi:10.1111/j.1467-8624.2010.01554.x.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale: Erlbaum.

Conduct Problems Prevention Research Group (CPPRG). (1990). Social Competence Scale: Teacher version. Available from the Fast Track Project Web site, http://www.fasttrackproject.org

Cooper, H., Charlton, K., Valentine, J. C., & Muhlenbruck, L. (2000). Making the most of summer school: A meta-analytic and narrative review. *Monographs of the Society for Research in Child Development, 65*, 1–118.

Corrigan, A. (2002). Parent-Teacher Involvement Questionnaire: Parent version (Fast Track Project Technical Report): Available from the Fast Track Project Web site, http://www.fasttrackproject.org

Durston, S., Thomas, K. M., Yang, Y., Ulug, A. M., Zimmerman, R. D., & Casey, B. J. (2002). A neural basis for the development of inhibitory control. *Developmental Science, 5*, F9–F16. doi:10.1111/1467-7687.00235.

Eyberg, S. M., Nelson, M. M., & Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal of Clinical Child and Adolescent Psychology, 37*, 215–237. doi:10.1080/15374410701820117.

Feingold, A. (2009). Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods, 14*, 43–45. doi:10.1037/a0014699.

Fenning, R. M., Baker, J. K., Baker, B. L., & Crnic, K. A. (2007). Parenting children with borderline intellectual functioning: A unique risk population. *American Journal on Mental Retardation, 112*, 107–121. doi:10.1352/0895-8017(2007)112[107:PCWBIF]2.0.CO;2.

Gargiulo, R. M., & Kilgo, J. L. (Eds.). (2011). An introduction to young children with special needs: Birth through age eight (3rd ed.). Belmont, CA: Wadsworth, Cengage Learning.

Gerstein, E. D., Pedersen y Arbona, A., Crnic, K. A., Ryu, E., Baker, B. L., & Blacher, J. (2011). Developmental risk and young children's regulatory strategies: Predicting behavior problems at age five. *Journal of Abnormal Child Psychology, 39*, 351–364. doi:10.1007/s10802-010-9471-5 .

Gioia, G. A., Isquith, P. K., Guy, S. C., & Kenworthy, L. (2000). Behavior rating inventory of executive function. *Child Neuropsychology, 6*, 235–238. doi:10.1076/chin.6.3.235.3152.

Gresham, F. M., & Elliot, S. N. (1990). *SSRS: Social Skills Rating System*. Bloomington: Pearson Assessments.

Hindman, A. H., & Morrison, F. J. (2012). Differential contributions of three parenting dimensions to preschool literacy and social skills in a middle-income sample. *Merrill-Palmer Quarterly, 58*, 191–223. doi:10.1353/mpq.2012.0012.

Kam, C.-M., Greenberg, M. T., & Kusché, C. A. (2004). Sustained effects of the PATHS curriculum on the social and psychological adjustment of children in special education. *Journal of Emotional and Behavioral Disorders, 12*, 66–78. doi:10.1177/10634266040120020101.

McClelland, M. M., Acock, A. C., Piccinin, A., Rhea, S. A., & Stallings, M. C. (2012). Relations between preschool attention span-persistence and age 25 educational outcomes. *Early Childhood Research Quarterly, 28*, 314–324. doi:10.1016/j.ecresq.2012.07.008.

McClure, K. S., Halpern, J., Wolper, P. A., & Donahue, J. J. (2009). Emotion regulation and intellectual disability. *Journal on Developmental Disabilities, 15*, 38–44.

McFadyen, A., & Hughes, M. (1996). A summer school for learning disabled children: Description and evaluation. *British Journal of Learning Disabilities, 24*, 124–128. doi:10.1111/j.1468-3156.1996.tb00218.x.

McIntyre, L. L., Blacher, J., & Baker, B. L. (2006). The transition to school: Adaptation in young children with and without intellectual disability. *Journal of Intellectual Disability Research, 50*, 349–361. doi:10.1111/j.1365-2788.2006.00783.x.

McIntyre, L. L., Eckert, T. L., Fiese, B. H., DiGennaro Reed, F. D., & Wildenger, L. K. (2010). Family concerns surrounding kindergarten transition: A comparison of students in special and general education. *Early Childhood Education Journal, 38*, 259–263. doi:10.1007/s10643-010-0416-.

Muthén, L. K., & Muthén, B. O. (1998-2012). Mplus user's guide (7th ed.). Los Angeles, CA: Muthén & Muthén.

Olson, S. L., Sameroff, A. J., Kerr, D. C. R., Lopez, N. L., & Wellman, H. M. (2005). Developmental foundations of externalizing problems in young children: The role of effortful control. *Development and Psychopathology, 17*, 25–45. doi:10.1017/S0954579405050029.

Pears, K. C., Fisher, P. A., Kim, H. K., Bruce, J., Healey, C. V., & Yoerger, K. (2013). Immediate effects of a school readiness intervention for children in foster care. *Early Education and Development, 24*, 771–791. doi:10.1080/10409289.2013.736037.

Pears, K. C., Kim, H. K., & Fisher, P. A. (2012). Effects of a school readiness intervention for children in foster care on oppositional and aggressive behavior in kindergarten. *Children and Youth Services Review, 34*, 2361–2366. doi:10.1016/j.childyouth.2012.08.015.

Pianta, R. C., & Cox, M. J. (Eds.). (1999). *The transition to kindergarten*. Baltimore: Paul H. Brookes.

Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research, 77*, 373–410. doi:10.3102/003465430305567.

Rimm-Kaufman, S. E., Pianta, R. C., & Cox, M. J. (2000). Teachers' judgments of problems in the transition to kindergarten. *Early Childhood Research Quarterly, 15*, 147–166. doi:10.1016/S0885-2006(00)00049-1.

Sattler, J. M., & Dumont, R. (2004). *Assessment of children: WISC-IV and WPPSI-III supplement*. La Mesa: Jerome M. Sattler.

Scarborough, A. A., Hebbeler, K. M., Spiker, D., & Simeonsson, R. J. (2011). Using survival analysis to describe developmental achievements of early intervention recipients at kindergarten. *Infants and Young Children, 24*, 133–152. doi:10.1097/IYC.0b013e3182104a7e.

Scherr, T. G. (2007). Educational experiences of children in foster care. *School Psychology International, 28*, 419–436. doi:10.1177/0143034307084133.

Shields, A., & Cicchetti, D. (1997). Emotion regulation among school-age children: The development and validation of a new criterion Q-sort scale. *Developmental Psychology, 33*, 906–916. doi:10.1037//0012-1649.33.6.906.

Walker, H. M., Severson, H. H., & Feil, E. G. (1995). *Early screening project: A proven child-find process*. Longmont: Sopris West.

Webster-Stratton, C., & Reid, J. (2003). Treating conduct problems and strengthening social and emotional competence in young children: The Dina Dinosaur treatment program. *Journal of Emotional and Behavioral Disorders, 11*, 130–143. doi:10.1177/10634266030110030101.

Wechsler, D. (2002). *Manual for the Wechsler Preschool and Primary Scales of Intelligence-third edition (WPPSI-III)*. San Antonio: Harcourt Assessment.

Zhang, D., Hsu, H.-Y., Kwok, O.-M., Benz, M., & Bowman-Perrott, L. (2011). The impact of basic-level parent engagements on student achievement: Patterns associated with race/ethnicity and socioeconomic status (SES). *Journal of Disability Policy Studies, 222*, 28–39. doi:10.1177/1044207310394447.

Zhou, Q., Sandler, I. N., Millsap, R. E., Wolchik, S. A., & Dawson-McClure, S. R. (2008). Mother-child relationship quality and effective discipline as mediators of the 6-year effects of the New Beginnings Program for children from divorced families. *Journal of Consulting and Clinical Psychology, 76*, 579–594. doi:10.1037/0022-006X.76.4.579.