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# Promoting Toddlers' Positive Social-Emotional Outcomes in Low-Income Families: A Play-Based Experimental Study

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This multimethod study of mothers and toddlers (a) examined the effectiveness of a play-based intervention (child-oriented play vs. play-as-usual) on children's cooperation with their mothers and socioemotional competence; (b) introduced a robust new measure of maternal engagement in the intervention, reflected in the dose of child-oriented play the mother delivered to the child; and (c) examined ecological factors that predicted maternal engagement, and the effect of engagement on the outcomes. Low-income mothers ( $N = 186$ , 11% Latino, 27% minority) were randomized into child-oriented play group or play-as-usual group, participated in 8 play sessions, and played daily with their children for 10 weeks. Microscopic coding of mothers' behavior in play sessions assessed the dose of child-oriented play delivered to children; mothers' diaries assessed time in daily play. Children's cooperation with maternal control, observed in the laboratory, and mother-rated competence were measured before randomization (Pretest), after play sessions (Posttest 1), and 6 months later (Posttest 2). Children in both groups made significant gains in both outcomes. The gains in cooperation appeared longer lasting in child-oriented play group. Both groups made significantly greater gains than a "historical community control" group, an unrelated longitudinal study without any intervention. Structural equation analyses revealed that married mothers and those with fewer children delivered higher doses of child-oriented play, and those doses predicted children's higher cooperation and competence, with the effects of earlier scores covaried. The dose of time spent in daily play had no effect. Child-oriented play may be a promising, effective, and inexpensive means of promoting toddlers' positive development.

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Developmental researchers have increasingly recognized the mutual, reciprocal nature of the parent–child socialization process and the young child's active role (Maccoby, 2007). The predominant approach to child active role in the parent–child relationship has stressed the child's *negative characteristics* (e.g., difficult temperament, aversive noncompliance) that elicit parental negative control and the unfolding coercive and adversarial long-term dyadic trajectories (Bell, 1968; Kuczynski & Kochanska, 1990). That emphasis may have been due to the fact that most of the pertinent research has been concerned with emerging behavior problems (e.g., Lipscomb et al., 2011; Lorber & Egeland, 2011; Pardini, 2008; Patterson, Reid, & Dishion, 1992).

What has been relatively overlooked, however, is that young children can also serve as active agents in their own socialization in a *positive sense*, and they can willingly, even enthusiastically, embrace parental influence. Children's willing, receptive, positive stance toward parents remains underappreciated in developmental psychology and psychopathology research; recently, aspects of such stance, such as the child's committed compliance with the parent, have begun to be studied (Kochanska & Aksan, 1995; Kochanska, Aksan, & Carlson, 2005; Kochanska, Barry, Aksan, & Boldt, 2008). Across several samples, child willing stance has been robustly associated, concurrently and longitudinally, with a host of positive developmental outcomes.

This view dovetails with a growing body of evidence that has shown that allowing the child to function as an active agent leading the interaction, with the parent positively attending to the child, following his or her lead, and cooperating with his or her cues can significantly enhance the child's future cooperation with the parent. In a classic study, Schaffer and Crook (1980) showed that mothers' "merging" with the child's attention focus enhanced the chances for compliance. Westerman (1990) found that mothers of children with compliance problems were worse at coordinating their behavior with the child's than were mothers of problem-free children. Strand (2002) reported that children of mothers taught how to let the child lead the play were more compliant. Parpal and Maccoby (1985) demonstrated that even a very short intervention instructing mothers how to follow the child's cues and allow him or her to lead the play significantly fostered children's compliance.

Many of those studies drew from successful parent training programs for noncompliant children, such as "special time" (Barkley, 1981), Child's Game (Forehand & McMahon, 1981; McMahon & Forehand, 2003), Parent-Child Interaction Therapy (Eyberg & Bussing, 2010), or The Incredible Years (Webster-Stratton & Reid, 2010), all of which emphasize child-led play. Those programs teach mothers to play with their young children in a way that allows the child to lead and the

mother to follow and comply with the child's cues and focus positive attention on the child. Mothers are also asked to suspend all behaviors that shift control to themselves and away from the child. Those programs promote and capitalize on children's capacity to assume an active, eager role in parent–child interaction.

We report results of *Play Study*—an experimental study of mother–toddler dyads that examined the effectiveness of a play-based intervention conceptually and empirically rooted in research on children's active, positive role in interaction. The dyads were randomized into two groups: a child-oriented play group, where mothers were trained in child-oriented play, and an active control play-as-usual group, where they were asked to play in the usual manner. The key element of child-oriented play is for mothers to allow children to lead the play. As for mothers, they respond to children, follow their lead, and positively focus attention on and reinforce children, and they refrain from any behaviors that assume control over the child, such as teaching, issuing commands, controlling or criticizing, or asking questions (McMahon & Forehand, 2003). The mothers were then observed in home and laboratory play sessions over approximately 10 weeks and asked to engage in one-on-one play with their children once a day at home.

The first goal of this study was to examine the effect of the intervention on children's *observed cooperation with their mothers* and *mother-reported child competence*, assessed prior to randomization (Pretest), immediately after the intervention (Posttest 1), and 6 months later (Posttest 2). We expected that compared to play-as-usual group, children in child-oriented play group would have higher scores on both outcomes assessed post-intervention.

In addition, as an exploratory venture, we also utilized data from an unrelated large longitudinal study in our laboratory, *Family Study*. That study, conducted with a low-risk community sample, did not implement any intervention. Fully parallel measures of children's cooperation with their mothers were repeatedly obtained between infancy and age 10. One of those assessments, at 38 months of age, closely approximated the age when many children in *Play Study* participated in Posttest 2, and an earlier assessment, at 25 months, approximated the age at Pretest, prior to randomization. Consequently, it was feasible to select a large, age-matched subset of *Play Study* children and to explore whether children in child-oriented play and play-as-usual groups in *Play Study* made greater developmental strides in cooperation than those in *Family Study*, the "historical community control group" (ICH, 2000).

The second goal was methodological: We developed a robust measure of mothers' engagement in the intervention. Because participants' engagement in any parenting intervention is a key predictor of success,

researchers have assessed both quantitative and qualitative aspects of such engagement. Typically, such measures have relied on records of attendance, a variety of ratings of engagement by interventionists, completed homework, or parents' reports (Baydar, Reid, & Webster-Stratton, 2003; Dumas & Albin, 1986; Garvey, Julion, Fogg, Kratovil, & Gross, 2006; Heinicke et al., 2000; Korfmacher et al., 2008; Nix, Bierman, McMahon, & The Conduct Problems Prevention Research Group, 2009; Nock & Ferriter, 2005; Raikes et al., 2006; Wen, Korfmacher, Hans, & Henson, 2010). But in behavioral interventions, where mothers are taught specific parenting techniques, such measures, although certainly valuable, do not capture *the consistency of observed maternal behavior with the received instructions or the amount of such behavior actually delivered to the child over the course of the intervention.*

We aimed to produce such objective behavioral measures of mothers' engagement in the intervention. To that effect, we coded mothers' behavior with their children with respect to all the specific elements of the instruction on child-oriented play techniques they had received during the training phase. Blind observers coded the entire videotaped play sessions during the intervention phase, using very short observational segments, thus producing a robust and sensitive measure of maternal engagement. Note that due to its behavioral and objective nature, variations in that measure accurately reflect both maternal engagement and, from the perspective of the child, the *dose of child-oriented play* that he or she received during the intervention. Consequently, we use both constructs interchangeably and often refer to the latter in this article.

Throughout the intervention phase, mothers also recorded their daily play with their children in diaries. Those data produced a more traditional measure of engagement—self-reported daily durations of the time mothers invested in playing with their children. We refer to this measure as the *dose of time played.*

The third goal was to examine predictors and implications of maternal engagement in the intervention. To that effect, we examined (a) ecological factors predicting the mothers' engagement, and (b) the role of engagement as directly influencing the outcomes. It is well known that not all parents engage in and benefit equally from interventions (Reyno & McGrath, 2006), and factors that predict the quality of parental engagement are of great interest. Nix et al. (2009) found that parents who faced more challenges in their lives were less likely to show high-quality engagement, which in turn led to worse outcomes. Parent, Forehand, Merchant, Long, and Jones (2011) found that marital status predicted engagement, with married parents (mostly mothers) more engaged than those who were single. Therefore, we tested a structural equation model in which factors such as mothers'

race, financial resources, the amount of recent life stress, marital status, and the number of children were considered the predictors of maternal engagement—or the dose of the intervention delivered to the child—and where the dose was considered a mediator of the potential links between those factors and the effects of the intervention.

This study involved highly diverse, low-income mothers of toddlers, a population broadly considered to be at a higher risk for children's future maladaptive social-emotional outcomes. Low income, although alone not a cause of poor outcomes, is associated with factors that are cumulatively detrimental, for example, low education level, family chaos, single parenting, unsafe neighborhood, parental stress and psychopathology, and often suboptimal parenting, as supported by a large body of research (Belsky, 1984; Bornstein & Bradley, 2003; Duncan, Morris, & Rodrigues, 2011; Evans & English, 2002; Gershoff, Aber, Raver, & Lennon, 2007; Jackson, Brooks-Gunn, Huang, & Glassman, 2000; McLoyd, 1998; Mistry, Vandewater, Huston, & McLoyd, 2002). Thus, low-income families are often targeted for preventive interventions.

## PLAY STUDY

### Method

#### *Participants*

Mothers of young children responded to flyers distributed in several counties in eastern Iowa. The flyers specified low income as one of the eligibility criteria. They were displayed on community boards and in libraries, pediatric offices, and day care centers, with an emphasis on locations frequented by low-income families (thrift stores; Women, Infants, and Children program offices; local Department of Health and Human Services offices; free medical clinics; Head Start locations; mobile homes parks; subsidized housing projects). To be accepted, the mother had to receive or be eligible for aid from a local, state, or federal government or faith-based agency (or Earned Income Tax Credit); the child had to be free of major health problems; and the mother had to be able to speak English during sessions. Graduate students were not eligible, despite low income. One-hundred eighty-six mothers and their toddlers (90 girls) were accepted. Mothers signed the informed consent forms prior to the study (all procedures had Institutional Review Board approval).

The demographic data follow: children's age,  $M = 30.33$  months,  $SD = 5.40$ ; mothers' age,  $M = 27.54$  years,  $SD = 4.87$ ; annual income per person,  $M = \$5,494.03$  dollars,  $SD = \$3,367.15$ ; number of children,  $M = 2.20$ ,  $SD = 1.08$ . In terms of education, 5.4% of mothers did not complete high school, 50% had a high school diploma or GED, 19.4% had an associate degree, and

15.3% had a bachelor's or a technical degree. In terms of marital status, 54.3% were married, 13.4% cohabitated, 30.6% were single or divorced, and 1.6% reported other arrangements. Regarding ethnicity and race, 10.8% were Hispanic, 87.1% not Hispanic, and 2.2% reported "other"; 1.6% were American Indian, 1.6% Asian, 14.5% African American, 72.6% White, 7% more than one race, and 2.7% did not report race. No significant differences between the two groups were found after randomization. There was a trend in terms of race (coded as White vs. non-White): in the child-oriented play group, there were 79% White and 21% non-White mothers, and in play-as-usual group, 67% and 33%, respectively,  $\chi^2(1) = 3.20, p < .10$ .

### Overview of Design

For every mother-child dyad, the study's sequence (approximately 10 months total) was as follows: (a) Pretest; (b) random assignment to child-oriented play group ( $N=94$ ) or play-as-usual group ( $N=91$ ; one mother dropped before the assignment); (c) training session, (d) play sessions and daily play over 9 to 10 weeks; (e) Posttest 1, and (f) Posttest 2, 6 months after Posttest 1.

### Procedures

**Pretest, Posttest 1, and Posttest 2.** These tests were 3-hr-long laboratory sessions. The scripts for all three sessions were largely parallel. Mothers and children interacted in two laboratory rooms. One resembled a naturalistically furnished living room that contained a low shelf with very attractive toys that were designated as off-limits to the child. Some less interesting toys were also provided. The other room was a sparsely furnished play room that contained a play table and chairs. The naturalistic quality of the paradigms and contexts was preserved. The contexts included, for example, a play time, a snack time, mother busy with questionnaires, mother and child engaging in certain tasks and games, and free time. The sequence was standard (mothers were able to refer to the script if they wished). Total sample sizes were as follows: at Pretest, 186; at Posttest 1, 168 (child-oriented play group,  $n=88$ , and play-as-usual group,  $n=80$ ); at Posttest 2, 162 ( $ns=84$  and 78, respectively). The rates of return at Posttest 1 or Posttest 2 were not different in the groups,  $\chi^2(1) = 1.80, ns$ , and  $\chi^2(1) < 1$ .

**Training session.** Typically within a week after the Pretest, following random assignment, mothers participated in the training session in the laboratory. First, the mother worked alone with a staff member while child care was provided.

In child-oriented play group, mothers were taught the play techniques drawn from "Child's Game" (McMahon & Forehand, 2003). The staff member explained each strategy using a handout and a video produced in our laboratory that portrayed racially diverse mothers modeling each strategy while playing with their children. The staff member then modeled each strategy and practiced with the mother, making sure of her understanding. Toward the end of the session, the mother practiced the new skills playing with the child, with the staff member present and providing feedback.

The mothers were asked to use three play techniques as often as possible during play (i.e., "Dos"): attend, follow child lead, and positives/rewards. All three techniques focus positive attention on the child and/or allow the child to direct the play. They were also asked to avoid four techniques (i.e., "Don'ts") that shift control from the child to the mother: questions, commands/suggestions, teaching, and critical, negative comments/discipline.

In play-as-usual group, the structure of the training session was similar, but no Dos or Don'ts were mentioned. The staff member talked with the mother, asked about toys the child liked, but did not model any behaviors. Then the mother and child played in their usual manner.

The mothers were told that over the next 10 weeks, they and the children would be observed in eight play sessions. They were also asked to *play with their children daily*, one-on-one, with no interruptions, for about 20 min, implementing the strategies they had been taught, or as usual.

**Play sessions and daily play.** Following the training session, all mothers and children took part in eight half-hour play sessions, one every 7 to 10 days (interspersing laboratory and home, four in each location). Standard toys were provided. Before each session, the staff member reviewed with the mother the skills she had been taught and answered all the questions (in the play-as-usual group, she reminded her to play in her typical manner). The staff member then left the dyad alone to play but continued to observe the entire session and make notes. In the laboratory, she observed from another room through a one-way mirror, and at home from the corner of the room. After the play period, she provided feedback to the mother. In the child-oriented play group, the feedback focused on the targeted "Dos" and "Don'ts"; in the play-as-usual group, the staff member commented on the toys the dyad used, and so on. All sessions were videotaped; 95% of mothers completed all eight sessions, and 98% completed at least seven.

The mothers also kept track of their daily play in diaries we had provided. That period of the study lasted on average 62.76 days (the two groups did not differ,  $t < 1$ ).

**Fidelity of intervention.** A blind coder coded the *fidelity with the protocol* for the staff who conducted play sessions. For every mother, four play sessions were selected randomly, and for each, the coder completed a checklist of four items that captured the key points of the initial instruction and feedback given to the mother (thus, perfect compliance with the protocol meant implementing 16 out of 16 items in the child-oriented play group and zero items in the play-as-usual group). In the former group, the staff members implemented 14 to 16 items with 94% of mothers and 12 to 13 items with the remaining 6%; in the latter group, compliance was 100%. The staff members held regular meetings to review each other's performance to assure consistency.

### Measures

All observational data were produced by individuals *blind to the mothers' group assignments*. The coders of the Pretest, Posttest 1, and Posttest 2 were never involved in conducting or videotaping the training sessions or play sessions. Coders of the play sessions did not see the instructions preceding the session or the feedback following the session (those segments were digitally separated from the mother-child play). For additional assurance, coders of play sessions did not code any other data for the mothers whom they saw in those sessions.

#### *Measures of Dose of Intervention: The dose of Child-Oriented Play and the Dose of Time Played*

**The dose of child-oriented play.** In all eight play sessions, maternal behavior was coded for every 10-s segment during the 20-min period when the dyad was playing together, after the staff member left, having provided the initial instruction and before she returned to give feedback. Thus, 120 segments per session (960 segments total) were coded for each dyad. All mothers were coded in the play sessions, even though the mothers in play-as-usual group never received any instructions. The coded behavioral categories (presence/absence) included the maternal "Dos" (attend, follow child lead, and positives/rewards) and maternal "Don'ts" (questions, commands/suggestions, teaching, and critical, negative comments/discipline). For three teams of coders, the ranges of intraclass correlations (ICCs) for the maternal behaviors were .78 to 1.00, .78 to .98, and .79 to .99.

There were several steps in *data aggregation*. The instances of each behavior were tallied for each play session and divided by the number of segments. Then, for each behavior, those proportion scores were averaged across all eight sessions. Next, a "Do" composite (an average of the scores for the three "Do" techniques)

and a "Don't" composite (an average of the scores for the four "Don't" techniques) were created. Finally, for each mother, we subtracted the "Don't" composite from the "Do" composite, to represent the *dose of child-oriented play*, consistent with the training session's instructions, delivered to the child across all eight play sessions.

**The dose of time played.** Recall that mothers kept track of their daily play sessions in the diaries. On average, mothers played 45.53 times. Mothers also marked the duration of each play (under 10, 10–20, or longer than 20 min). To create a measure of *dose of time played*, we weighted the number of daily plays by the duration of each play. Play under 10 min was weighted by 1, 10 to 20 min weighted by 2, and longer than 20 min weighted by 3. Both the number of the daily play sessions and the dose of time played were lower in child-oriented play group than in play-as-usual group, respectively— $M = 41.86$ ,  $SD = 16.26$  and  $M = 49.51$ ,  $SD = 13.22$ ,  $t(167) = 3.34$ , and  $M = 85.49$ ,  $SD = 37.08$  and  $M = 114.26$ ,  $SD = 38.23$ ,  $t(166) = 4.95$ , both  $ps < .01$ —most likely because play in the former group was more effortful and less intuitive.

#### *Measures of Predictors of Dose of Child-Oriented Play and Time Played*

The predictors of the dose of child-oriented play and time played were derived from the questionnaires completed at Pretest, and included mothers' race, coded as White versus non-White; the annual family income, computed per person in the household; marital status, coded as married versus nonmarried; number of children; and the total amount of stress experienced in the last 12 months, reported in Life Experiences Survey (Sarason, Johnson, & Siegel, 1978). The stress score was the total of the mother's ratings of multiple life events, such as deaths, illnesses, relationships, financial problems, with each event rated from 1 (*not stressful*) to 4 (*very stressful*),  $M = 25.85$ ,  $SD = 18.64$ , not significantly different in the two groups.

#### *Measures of Outcomes: Children's Cooperation with Mothers' Control and Mother-Rated Overall Competence*

**Children's cooperation with maternal control.** Children's behavior in all control encounters that involved the attractive off-limits toys was coded for 45 min at each assessment (Pretest, Posttest 1, and Posttest 2) during the contexts when the child had easy access to the shelf with the toys. Examples of such contexts included mother busy, mother and child having a snack, or free time.

The coding was event triggered: Child behavior was coded whenever an instance of control involving the toys

occurred. The first team of coders coded all instances when the child oriented toward the prohibited toys; looked at, touched, approached, talked about them; or when the mother commented on the toys. This marked the onset of an episode; the episode continued until its offset was marked (when the child reoriented away from the toys for at least 30 s). Reliabilities for the onset-offset coding (ICCs) ranged from .85 to .99. A second team of coders then coded the child's behavior for each 30-s segment within the marked episodes. Reliability for the coding of child behavior ( $\kappa$ ) was .88.

Child behavior was coded as committed compliance or one of several forms of noncompliance (the latter were all aggregated in the current analyses). Committed compliance was reflected in self-regulated, eager adherence to maternal prohibition; the child complied without the need for maternal sustained control and indicated that she or he wholeheartedly endorsed the prohibition, for example, by pointing to the toys; shaking head; and saying "no, no," "don't touch" (Kochanska & Aksan, 1995). All instances of each behavior were tallied and divided by the number of the 30-s segments. On average, there were 46.63 ( $SD=12.71$ ) segments during Pretest, 44.37 ( $SD=13.94$ ) during Posttest 1, and 44.31 ( $SD=12.84$ ) during Posttest 2. The final score of *the child's cooperation with maternal control* was the difference between the compliance and noncompliance scores.

*Children's mother-rated overall competence.* At Pretest, Posttest 1, and Posttest 2, mothers completed Infant-Toddler Social and Emotional Assessment, an instrument that has shown good psychometric qualities in several large studies (Briggs-Gowan, Carter, Bosson-Heenan, Guyer, & Horwitz, 2006; Carter, Briggs-Gowan, Jones, & Little, 2003). We used the overall score for Competence Domain that encompasses six scales that describe positive, adaptive behaviors that indicate good social-emotional functioning in the toddler period (numbers of items in parentheses): Compliance (8), Attention (5), Imitation/Play (6), Mastery Motivation (6), Empathy (7), and Prosocial Peer Relations (5). Mothers rated each item as 0 (*not true/rarely*), 1 (*somewhat true/sometimes*), or 2 (*very true/often*). The final scores were the means of the six scales (Cronbach's alphas, .72-.77 at the three assessments).

## Results

### *Overview of the Analyses*

The first set of analyses examined whether the two types of play-based interventions (child-oriented or as-usual) had different impacts on child cooperation with maternal control and child competence, assessed

at Posttest 1 and Posttest 2. Toward that end, for each outcome, we first conducted an overall multivariate analysis of variance with group as the between-subject variable (two levels, child-oriented play vs. play-as-usual), and time of assessment as the within-subject variable (three levels, Pretest vs. Posttest 1 vs. Posttest 2).<sup>1</sup> We followed up the significant effects by separate  $t$  tests, when indicated. All descriptive data for children's outcomes are in Table 1.

The second set of analyses examined (a) the ecological predictors of the dose of the intervention mothers delivered to their children; (b) the effects of the dose of the intervention on the outcomes at Posttest 1 and Posttest 2; and (c) the indirect effects of the predictors on outcomes, mediated by the dose. These questions were addressed using path analysis in structural equation modeling (SEM).

Although mothers in play-as-usual group spontaneously used some of the child-oriented play strategies, they did so very occasionally and their scores were extremely low. The  $t$  test comparing the dose of child-oriented play revealed a large difference between the child-oriented play and play-as-usual groups, respectively,  $M=.34$ ,  $SD=.07$ , and  $M=.03$ ,  $SD=.06$ ,  $t(175)=31.65$ ,  $p<.0001$ , with virtually *no overlap* in confidence intervals for the means at .0001 alpha level: [.31, .37] and [.00, .06], respectively. Consequently, the dose of child-oriented play was considered only for the child-oriented play group. The dose of time played was considered for both groups.

### *Effects of the Play-Based Intervention on Children's Outcomes*

*Cooperation with mothers' control.* There was a significant effect of time,  $F(2, 159)=43.81$ ,  $p<.001$ , but it was qualified by a significant interaction effect of Group  $\times$  Time,  $F(2, 159)=3.30$ ,  $p<.05$ . The follow-up  $t$  tests were conducted separately for child-oriented play and play-as-usual groups. In child-oriented play group, there was a significant increase in the cooperation scores between Pretest and Posttest 1,  $t(87)=-4.03$ ,  $p<.001$ ; between Pretest and Posttest 2,  $t(83)=-5.68$ ,  $p<.001$ ; and a *continued* significant increase between Posttest 1 and Posttest 2,  $t(83)=-2.18$ ,  $p<.05$ .

In the play-as-usual group, however, only the first two changes were significant: an increase between Pretest and Posttest 1,  $t(79)=-7.24$ ,  $p<.001$ , and between Pretest and Posttest 2,  $t(77)=-6.37$ ,  $p<.001$ . There was no further increase in cooperation between Posttest 1 and Posttest 2,  $t(77)<1$ . We note, however,

<sup>1</sup>Preliminary multivariate analyses of variance with gender added as a between-subject factor did not reveal interactions that involved gender and group.

TABLE 1  
Play Study: Descriptive Data for Children's Outcome Measures, Observed Cooperation With Mothers' Control and Mother-Rated Overall Competence

	Group											
	Child-Oriented Play						Play-as-Usual					
	Pretest <sup>a</sup>		Posttest 1 <sup>b</sup>		Posttest 2 <sup>c</sup>		Pretest <sup>d</sup>		Posttest 1 <sup>e</sup>		Posttest 2 <sup>f</sup>	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Cooperation With Mothers' Control	.55	.34	.66	.37	.73	.32	.48	.33	.68	.30	.70	.31
Overall Competence	1.45	.21	1.48	.21	1.54	.22	1.38	.23	1.43	.24	1.50	.23

<sup>a</sup>N = 94.

<sup>b</sup>N = 88.

<sup>c</sup>N = 84.

<sup>d</sup>N = 91.

<sup>e</sup>N = 80.

<sup>f</sup>N = 78.

that although children became significantly more cooperative between Pretest and Posttest 1 in both groups, the effect size was, surprisingly, smaller in child-oriented play group ( $d = .31$ ) than in play-as-usual group ( $d = .58$ ).

**Mother-rated overall competence.** There was a significant effect of time,  $F(2, 159) = 22.02$ ,  $p < .001$ , but no interaction with group, indicating similar changes over time in both groups. Mothers rated their children as increasingly competent: At Pretest,  $M = 1.42$ ,  $SD = .22$ ; at Posttest 1,  $M = 1.46$ ,  $SD = .22$ ; at Posttest 2,  $M = 1.52$ ,  $SD = .23$ . All the changes were significant: from Pretest to Posttest 1,  $t(167) = -2.84$ ,  $p < .01$ ; from Pretest to Posttest 2,  $t(161) = -6.51$ ,  $p < .001$ ; and from Posttest 1 to Posttest 2,  $t(161) = -4.29$ ,  $p < .001$ .

#### *Relations Among the Ecological Predictors, the Dose of Child-Oriented Play and Dose of Time Played, and Children's Outcomes*

Initially, in child-oriented play group, we constructed models where the ecological factors predicted both the dose of child-oriented play and the dose of time played, and then the two dose variables predicted outcomes at Posttest 1 and Posttest 2. However, we found that none of the ecological factors significantly predicted the dose of time played and that the dose of time played had no significant influence on any outcome. Therefore, the following SEM analyses tested the models that included only the dose of child-oriented play as a mediator between the ecological factors and the outcomes.<sup>2</sup>

<sup>2</sup>When we added gender as an additional covariate in the SEM analyses, the path coefficients were essentially unchanged.

Recall that in play-as-usual group we examined only the dose of time played. However, none of the ecological factors predicted the dose of time played, and it, in turn, had no effect on the outcomes. Thus, we do not present the results of the analyses for the play-as-usual group.

**Predicting children's observed cooperation with their mothers' control.** Figure 1 represents the path analysis in SEM that examines the ecological predictors of the dose of child-oriented play and its subsequent effects on children's cooperation with mothers' control at Posttest 1 and Posttest 2. Five exogenous factors (mothers' race, the annual family income per person in the household, the total amount of stress in the last year, marital status, and the number of children) were modeled to predict the dose of child-oriented play. Then, that dose was modeled to predict children's cooperation both at Posttest 1 and Posttest 2. The score at Posttest 1 was additionally modeled to predict the score at Posttest 2. Following the guidelines by McGowan, Nix, Murphy, Bierman, and Conduct Problems Prevention Research Group (2010), we also covaried the Pretest cooperation scores on the outcome to ameliorate selection biases, often present in dose-response analyses. We used maximum likelihood method for parameter estimation and we applied full information maximum likelihood imputation to treat missing data.

This model fit the data well, as indicated by good model fit indices,  $\chi^2(11) = 13.45$ ,  $p = .27$ ; comparative fit index (CFI) = .99, Tucker-Lewis index (TLI) = .97, root mean square error of approximation (RMSEA) = .05, standardized root mean square residual (SRMR) = .04 (Hu & Bentler, 1999). The mothers' nonmarried status and higher number of children both led to lower maternal engagement or lower doses of child-oriented play. Race,



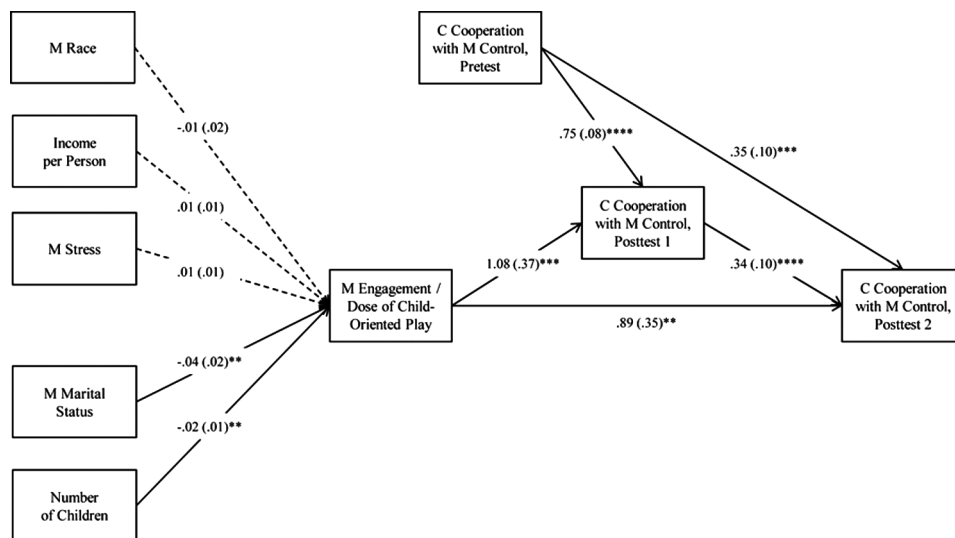


FIGURE 1 Play Study: Structural equation path model analyzing the casual sequence from the ecological factors to maternal engagement or the dose of child-oriented play to children’s cooperation with mothers’ control at Posttest 1 and Posttest 2. Note. Dashed lines represent nonsignificant effects. Solid lines represent significant effects. M = mother; C = child. \*\* $p < .025$ . \*\*\* $p < .01$ . \*\*\*\* $p < .001$ .

annual income, and the amount of stress, however, were not significant predictors. Higher doses of child-oriented play led to the increase in children’s cooperation at Posttest 1, controlling for the Pretest score, and again at Posttest 2, controlling for both Pretest and Posttest 1 scores. The mothers’ marital status ( $b = -.05$ ,  $SE = .02$ ,  $p < .05$ ) and the number of children ( $b = -.02$ ,  $SE = .01$ ,  $p < .05$ ) had significant indirect effects on the Posttest 2 score. Indirect effect of the dose of child-oriented play on the Posttest 2 score mediated by the Posttest 1 score was also significant ( $b = .08$ ,  $SE = .04$ ,  $p < .05$ ).

*Predicting children’s mother-rated overall competence.* We initially tested the same model as in the prior SEM analysis: Five exogenous factors predicting maternal engagement, or the dose of child-oriented play, and the subsequent effects of that dose on children’s competence at Posttest 1 and Posttest 2, using maximum likelihood and full information maximum likelihood strategies. In the initial model, however, model fit indices were not acceptable,  $\chi^2(11) = 22.66$ ,  $p < .05$ ; CFI = .93, TLI = .86, RMSEA = .11, SRMR = .05. Allowing an additional direct path from

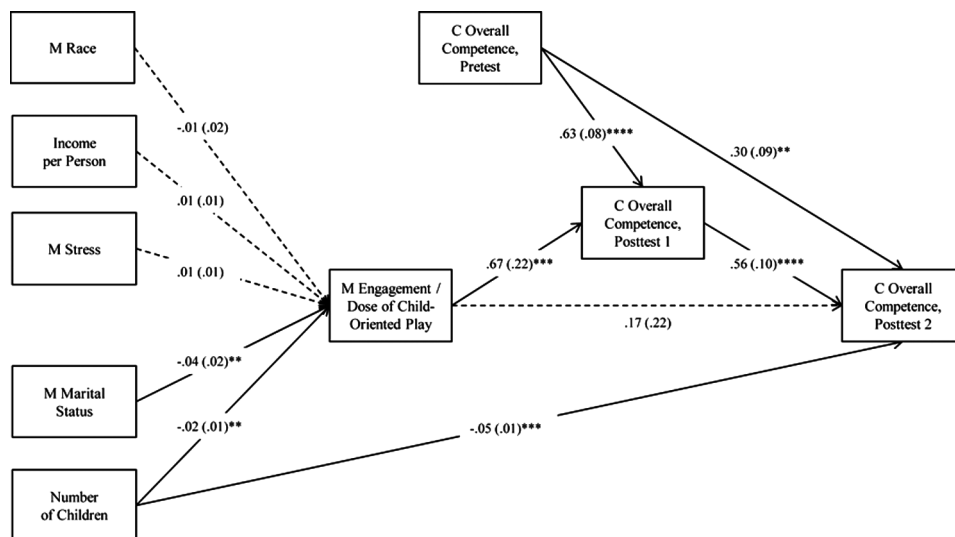


FIGURE 2 Play Study: Structural equation path model analyzing the casual sequence from the ecological factors to maternal engagement or the dose of child-oriented play to children’s overall competence at Posttest 1 and Posttest 2. Note. Dashed lines represent nonsignificant effects. Solid lines represent significant effects. M = mother; C = child. \*\* $p < .025$ . \*\*\* $p < .01$ . \*\*\*\* $p < .001$ .

the number of children to the score at Posttest 2 resulted in good fit,  $\chi^2(10) = 11.40$ ,  $p = .33$ ; CFI = .99, TLI = .98, RMSEA = .04, SRMR = .04. Figure 2 represents this revised model. Again, mothers' nonmarried status and a higher number of children predicted lower dose of child-oriented play, and the dose of child-oriented play predicted children's competence at Posttest 1 but not at Posttest 2. The effect of the dose of child-oriented play on the Posttest 2 score was significant only in an indirect way ( $b = .37$ ,  $SE = .14$ ,  $p < .01$ ), mediated by the Posttest 1 score. Consequently, we infer that the beneficial effects for child competence occurred immediately after the intervention, and the continued improvement at Posttest 2 reflected largely the developmental stability of the construct.

### FAMILY STUDY (HISTORICAL COMMUNITY CONTROL GROUP)

#### Method

##### *Participants*

The study involved a community sample of 102 two-parent families of normally developing infants, volunteers for a longitudinal study broadly advertised in the same area of eastern Iowa as Play Study (a college town, a small city, and rural areas and towns). They represented a broad range of education. Among mothers, almost 25% had a high school education or less, 54% had an associate or college degree, and 21% had postgraduate education. The respective figures for fathers were almost 30%, 51%, and 20%. The annual family income ranges were as follows: 8% earned less than \$20,000, 17% earned between \$20,000 and \$40,000, 26% earned between \$40,000 and \$60,000, and 49% earned over \$60,000. Regarding ethnic background, 90% of mothers were White, 3% Hispanic, 2% African American, 1% Asian, 1% Pacific Islander, and 3% "other" non-White. Among fathers, 84% were White, 8% Hispanic, 3% African American, 3% Asian, and 2% "other". In 20% of families, one or both parents were non-White.

##### *Overview and Measures*

In this article, we report measures of children's cooperation with their mothers, observed in the laboratory at two time points: at 25 months ( $N = 100$ , 50 girls) and at 38 months ( $N = 99$ , 49 girls). At both times, mothers and children were observed in the laboratory sessions and naturalistic contexts involving prohibited toys, fully comparable to those in Play Study (total observed times were 37 min at 25 months and 27 min at 38 months). Children's behaviors, committed compliance and noncompliance, were coded using the same coding system as in Play Study. Reliabilities of coding

were as follows: at 25 months, for onset-offset of episodes, ICCs = .84–.96, and for child behavior,  $\kappa$ s = .67–.87; at 38 months, for onset-offset  $\alpha = .86$ , and for child behavior,  $\kappa = .71$ . Data were aggregated in the same manner as in Play Study, and the final score of *the child's cooperation with maternal control* was the difference between the committed, self-regulated compliance and noncompliance scores.

#### Results

##### *Overview*

The goal of the analyses was to use Family Study as a historical community control group, where no intervention was implemented, and to compare the scores on children's cooperation with those in two Play Study groups: child-oriented play and play-as-usual. To that effect, first, we selected a subset of children from Play Study whose ages at Posttest 2 matched closely the ages of Family Study children at the 38-month assessment (at that time, Family Study children were 36–43 months,  $M = 38.17$ ,  $SD = 1.05$ ). There were 92 children in Play Study who were 35 to 43 months at Posttest 2 ( $M = 38.20$ ,  $SD = 2.62$ ), 45 in the child-oriented play group ( $M = 38.56$  months,  $SD = 2.73$ ), and 47 in the play-as-usual group ( $M = 37.85$  months,  $SD = 2.48$ ). One-way analysis of variance comparing child ages in the three groups (the two Play Study groups and Family Study) indicated that they were not significantly different,  $F(2, 189) = 1.50$ , *ns*.

##### *Comparison of Play Study and Family Study*

The focus of the comparison was on the changes in the scores in child cooperation from Pretest to Posttest 2 in the Play Study groups, over a 10-month average interval, and from the 25-month assessment to the 38-month assessment in Family Study, over a 13-month average interval. Because the children in Play Study were older at Pretest,  $M = 28.34$ ,  $SD = 2.75$ , than were Family Study children at the 25-month assessment,  $M = 25.24$ ,  $SD = .53$ ,  $t(190) = -11.02$ ,  $p < .001$ , the initial age was treated as the covariate in a multivariate analysis of variance, along with annual family income. Group was the between-subject variable (three levels: Play Study child-oriented play vs. Play Study play-as-usual vs. Family Study), and time of assessment (two levels, Play Study Pretest/Family Study 25 months vs. Play Study Posttest 2/Family Study 38 months) as the within-subject variable.

There was a significant interaction of group by time,  $F(2, 187) = 3.76$ ,  $p < .05$ . The follow-up *t* tests indicated that children in both Play Study groups became significantly more cooperative between Pretest and Posttest

2: in the child-oriented play group, from  $M = .58$ ,  $SD = .36$  to  $M = .72$ ,  $SD = .38$ ,  $t(44) = 4.08$ ,  $p < .001$ , and in the play-as-usual group, from  $M = .46$ ,  $SD = .36$  to  $M = .68$ ,  $SD = .29$ ,  $t(46) = 5.33$ ,  $p < .001$ . There was virtually no change in cooperation in Family Study from 25 to 38 months: from  $M = .48$ ,  $SD = .49$  to  $M = .49$ ,  $SD = .46$ ,  $t(98) = .09$ , *ns*. We illustrate the findings using the change scores (Posttest 2 score – Pretest score in Play Study, and 38-month score – 25-month score in Family Study) in the three groups in Figure 3. The change scores in the Play Study groups, although not different from each other, were both significantly higher than the scores in Family Study. The effect size (Cohen's  $d$ ) between the change scores in the child-oriented play group and Family Study was .38, and between the play-as-usual group and Family Study was .55 (.20 is a small effect size and .50 a medium effect size; Cohen, 1992).

## Discussion

### *Effectiveness of the Play-Based Intervention*

This multimethod, multiassessment experimental study indicated that maternal participation in a 10-week program when the mother–child dyads engaged daily in one-on-one, uninterrupted brief period of play interaction resulted in positive effects on children's observed cooperation with the mothers and on mother-rated child socioemotional competence. Although there were significant improvements in both groups, there was a modest effect favoring the child-oriented play group: In that group only, children's cooperation appeared to continue to increase over 6 months after the intervention. It is possible that a longer term follow-up would reveal more such delayed positive effects. Cooperation has been

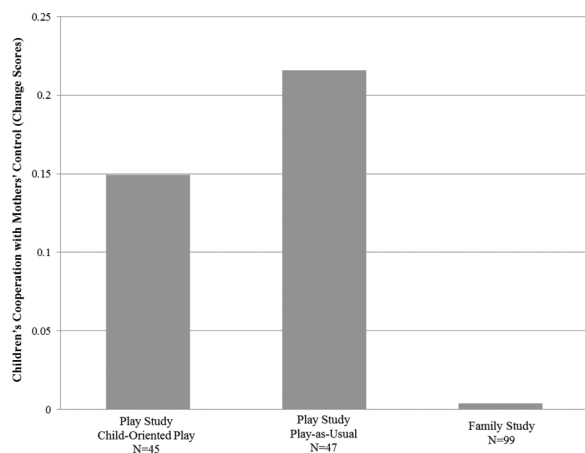


FIGURE 3 Play Study and Family Study: Changes in children's cooperation with maternal control in Play Study (from Pretest to Posttest 2) and in Family Study (from the 25-month assessment to the 38-month assessment).

long seen as a desirable, key developmental landmark (Kopp, 1982) that reflects a growth of self-regulation and a positive, receptive stance toward the parent.

Children made significant positive strides in observed cooperation with the mothers and in mother-rated overall competent, adaptive behaviors, such as empathy, pretend play, or compliance. Given that those improvements occurred already over the period of, on average, 82 days between Pretest and Posttest 1, it is highly unlikely that they resulted from normative developmental processes and maturation. Of course, this hypothesis cannot be tested without having a group with comparably timed assessments but with no intervention at all. In designing the current study, we had opted for strong and conservative active control conditions in the play-as-usual group (ICH, 2000), as very few—if any—studies of play-focused interventions have done. We were, however, able to utilize, in an exploratory fashion, data from an unrelated longitudinal study in our laboratory, Family Study, where children and parents were followed without any intervention, and data on observed cooperation were obtained and coded in the exact same manner as in Play Study. Consequently, that sample of mothers and children served as a historical community control group for an age-matched subset of children from Play Study.

The analyses comparing the subset of Play Study children with those in Family Study revealed robust and significant differences. Despite the fact that Play Study involved a higher-risk population, there was a significantly greater positive change in children's cooperation over 10 months, from Pretest to Posttest 2, than the change in Family Study, comprised of low-risk families, over 13 months, over matching developmental periods approximately from age 2 to 3. Of course, in view of the limitations of this approach, the findings have to be interpreted with caution. They need to be replicated using a low-income control group of mothers, recruited using the same criteria and participating in the same protocol (minus any intervention) as the mothers in Play Study. If replicated, those findings will imply that daily, one-on-one, mother–child play, especially although not necessarily child oriented, can robustly enhance children's readiness to cooperate with parents.

In this context, it was interesting that in the play-as-usual group, mothers very rarely engaged spontaneously in the specific play style that positions the child in the leading role. But, also of note, a relatively brief training resulted in a dramatic increase in mothers' adoption of the recommended techniques.

*The methodological contribution: A new measure of maternal engagement in the intervention or the dose of child-oriented play.* The development of an objective,

reliably coded, behaviorally based, and robust measure of the quality of mothers' engagement is a positive contribution to the field because most extant measures rely on ratings by interventionist or parental self-reports. Further, that measure can legitimately be viewed as a precise estimate of the dose of child-oriented play actually delivered to the child over the course of the eight home and laboratory sessions in the intervention phase. We believe that in future research, measures of engagement that rely on objective behavioral coding of parents' behaviors with regard to the content of the specific training they received should be encouraged, despite being labor and cost intensive.

*Ecological factors, mothers' engagement in the intervention, and children's outcomes.* The SEM analyses yielded a clear picture of the causal paths in the examined chain. Several findings are noteworthy. First, we note that maternal engagement was unrelated to the Pretest scores for the outcomes, and thus the significant effects of the intervention cannot be explained by any preexisting differences among the mothers. Second, married mothers and those with fewer children were more engaged in child-oriented play and delivered higher doses of it to their toddlers than unmarried mothers and those with more children, consistent with the extant evidence (Parent et al., 2011; Reyno & McGrath, 2006). Perhaps competing hardships leave unmarried mothers and those with several children with insufficient internal resources to fully commit to the intervention. As well, perhaps in married families, fathers become interested in child-directed play and deliver additional doses of it to their children, reinforcing the positive effects on the outcomes.

Third, the higher dose of child-oriented play predicted more cooperation and higher competence immediately after the intervention, controlling for possible biases by covarying the robust effects of Pretest scores (McGowan et al., 2010). Remarkably, in the case of child cooperation, the higher dose of child-oriented play *continued* to predict significant improvements even after the longitudinal stability was controlled by covarying equally robust effects of Posttest 1 scores.

Somewhat surprisingly, we found no significant prediction from the sheer amount of daily play, as reported by mothers, on the assessed outcomes. It is entirely possible that mothers' reports did not accurately reflect the actual time spent in play, due to memory errors, self-presentation biases, or other expectancies. Mothers may not have remembered correctly how long they had played, or they may have wished to present themselves in a desirable light, as highly compliant with our instructions. The related phenomena are well known in social (Orne, 1962) and clinical (Kazdin, 1979) psychology. Reliance on maternal reports of daily play, although

necessary, is a limitation of our study. At the same time, however, this limitation elucidates even more clearly the value of objective, behavioral measures of parental engagement in interventions and precise measures of the dose of intended behavior actually delivered to the child, in contrast to reliance on maternal reports. In fact, mother-reported and observed measures of such dose were only modestly correlated,  $r(88) = .25, p < .05$ .

Questions for future research concern mechanisms through which child-oriented play exerts positive impact. One possibility is that the effects may be mediated by child positive mood (Lay, Waters, & Park, 1989). Another possibility is that such play promotes child broad willing stance toward the parent (Forman & Kochanska, 2001), which in turns fosters mutually positive reciprocal set in the parent-child relationship and long-term adaptive implications for socialization (Kochanska, Aksan, Prisco, & Adams, 2008). Yet another possibility is that "special" one-on-one, mother-toddler daily interaction enhances the quality of the overall attachment bond, perhaps particularly among stressed families where such routines may be rare.

#### *Clinical implications*

This study indicates that daily, one-on-one mother-child play over a relatively short period—approximately 10 weeks—can be a powerful factor in promoting children's positive social-emotional development in low-income families. Furthermore, the study emphasizes the benefits of obtaining objective, behaviorally based measures of maternal engagement or the dose of intervention actually delivered to the child. The findings, based on such objective measures of mothers' engagement, dovetail with a large body of research that has emphasized the critical importance of the participants' motivation, effort, and skill invested in the process of parent training. As well, the findings inform research in developmental psychopathology because they emphasize that capitalizing on young children's ability to behave as active agents in play interactions with mothers can effectively enhance their mother-child relationship and social development. In addition, the findings reiterate the importance of considering the role of family structure with regard to engaging mothers in the intervention process and indicate that additional efforts may be needed to enhance effectiveness of parenting programs for single parents and those with several young children.

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