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PAPER

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Dramatic pretend play games uniquely improve emotional control in young children

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Abstract

Pretense is a naturally occurring, apparently universal activity for typically developing children. Yet its function and effects remain unclear. One theorized possibility is that pretense activities, such as dramatic pretend play games, are a possible causal path to improve children's emotional development. Social and emotional skills, particularly emotional control, are critically important for social development, as well as academic performance and later life success. However, the study of such approaches has been criticized for potential bias and lack of rigor, precluding the ability to make strong causal claims. We conducted a randomized, component control (dismantling) trial of dramatic pretend play games with a low-SES group of 4-year-old children (N = 97) to test whether such practice yields generalized improvements in multiple social and emotional outcomes. We found specific effects of dramatic play games only on emotional self-control. Results suggest that dramatic pretend play games involving physicalizing emotional states and traits, pretending to be animals and human characters, and engaging in pretend scenarios in a small group may improve children's emotional control. These findings have implications for the function of pretense and design of interventions to improve emotional control in typical and atypical populations. Further, they provide support for the unique role of dramatic pretend play games for young children, particularly those from low-income backgrounds. A video abstract of this article can be viewed at: https://youtu.be/2GVNcWKRHPk

RESEARCH HIGHLIGHTS

- We assess the discrete effects of dramatic pretend play games on social and emotional development using blind experimenters and interventionists, dismantling active control conditions, and non nested data.
- We find dramatic pretend play games improve emotional control across two tasks and one observation-based measure in low-SES 4-year-old children.
- We find that the dramatic pretend play games do not positively affect empathy and theory of mind, with implications for the sequence of development of social and emotional skills.
- Dramatic pretend play games could be used as an effective intervention in this population to improve emotional control.

1 | INTRODUCTION

There are many domains of social-emotional development considered important to promote in youth (e.g., theory of mind, affective empathy, emotion control, prosocial behavior; see Beauchamp and Anderson, 2010; CASEL, 2013; Rose-Krasnor, 1997). Pretend and dramatic play have been proposed to positively affect nearly all of them; however, virtually no methodologically rigorous studies have directly tested such effects (Lillard et al., 2013). In this study, we aim to more rigorously and precisely specify which social-emotional domains—if any—are affected by engaging in a specific kind of pretend activity, dramatic pretend play games, during a crucial developmental stage—the preschool years. Preschool is a particularly important time to positively affect social-emotional development as these skills

predict children's school readiness, school adjustment, and functioning in groups in school settings (Bierman, 2004; Bierman & Motamedi, 2015; Zine, Bloodworth, Weissberg, & Walberg, 2007). At this age, the parallel development of executive function, attentional control, arousal regulation, social problem solving, and language provide a unique opportunity to intervene on the trajectory of social and emotional development at a formative stage (Bierman & Motamedi, 2015; Blair, 2002).

Children who come from low-SES households are at particular risk for beginning school with delays in social-emotional skills and self-regulation (McClelland, Acock, & Morrison, 2006). A lack of social-emotional skills is often associated with negative social outcomes such as aggression and low achievement (Denham et al., 2012), psychopathy (Jones, Happé, Gilbert, Burnett, & Viding, 2010), bullying (Jolliffe & Farrington, 2006), substance use (Elias et al., 1997), being "hard to manage" (Hughes, White, Sharpen, & Dunn, 2000) and hostility (Belacchi & Farina, 2012). In children who are already at risk for negative social and cognitive outcomes (e.g., children from low-SES households), difficulties in emotional control specifically (Mezzacappa, 2004) are associated with heightened risk for emotional and behavioral problems. Resiliency in socially disadvantaged children is associated with greater emotional control (Buckner, Mezzacappa, & Beardslee, 2003). Importantly, social-emotional interventions tend to be most effective for children at the highest levels of risk (Denham et al., 2012).

There have been numerous interventions and curricula developed and tested to increase social and emotional learning in young children from all backgrounds (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Large-scale school-wide social-emotional learning programs have been shown to be effective at increasing prosocial behavior and decreasing aggression at both the child and school level, particularly among those children who begin with lower levels of social-emotional skills (CPPRG, 2011). These programs vary in nature. Some focus on explicit naming of emotions, and developing language skills around emotion (Greenberg, 2006), or discussions of friendships and social problem solving (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008), while others teach teachers to better integrate social competence skills into classroom management (Raver et al., 2011). Most of these interventions, when developed for preschool children, involve some element of pretend play or engagement in fiction and drama, through puppet shows, socio-dramatic play, or reading story books (Bierman & Motamedi, 2015; Bodrova & Leong, 2007; Ursache, Blair, & Raver, 2012). However, the unique contribution of such elements to the efficacy of such interventions is unknown.

One type of intervention/activity that has received considerable attention for increasing social abilities is engaging in imaginary worlds through pretend play, dramatic play, acting, or drama. In all of these activities, a child engages in a non-literal action, embodying characters, emotions, or behavior (Fein, 1981; Weisberg, 2015). Pretense requires the creation and maintenance of a quarantined world, the ability to task switch between the real and pretense worlds, and the maintenance of the appropriate scripts for each world (Thibodeau, Gilpin, Brown, & Meyer, 2016). Engaging in pretend worlds may therefore train attentional control and task-switching abilities, increasing executive function, which causes resulting gains in cascading abilities (Happé, Cook, & Bird, 2017) such as emotional understanding and control.

The type of pretense engagement we focus on here are dramatic pretend play games (DPPG). These are short, engaging activities, led by an adult, that involve an individual child or small group of children engaging in creating movement and sound based on a prompt about a character, situation, animal, emotion or idea. DPPGs are thought of as the basis for acting classes and improvisational theatre (Spolin, 1999). They can involve activities as simple as walking around a space pretending to be various animals, to creating an "orchestra" out of the sounds that accompany various emotions (e.g., an orchestra of sad crying and happy laughing), or more fully fledged socio-dramatic pretense scenes in which children take on characters and improvise to act out situations. The group leader gives a prompt (e.g., Walk like a bear! Or Let's pretend it's your unbirthday) and then the participants take that prompt in the direction they choose. The group leader offers follow-up suggestions, ensures that participants are staying on task, in character, and interacting with the characters in the pretend world created together. Games used in the current intervention, following Spolin, were chosen from reading books and articles on dramatic play games for children (e.g., Bedore & Barkley, 2004; Castaldo, 1996; Nyberg, 1994; Rooyackers, 1998); see Goldstein (under revised review) for a full description of the development of the activities. These are different from standard, open ended, character and story driven "pretend play" in a few ways: (1) there is guidance and leadership throughout some of the games, and freedom to create scenarios and characters in others; (2) some games have more realistic props, some have less realistic props, and others have no props at all; (3) children are not engaged in scenarios based on well-known stories, and do not use puppets; and (4) some of the games are purposefully long and open ended, others short and prescriptive. The goal in the development of these activities was to provide the broadest possible variety of dramatic pretend play experiences and games over the short intervention time.

There have been extensive claims made regarding connections between pretend activities such as DPPGs and positive outcomes in emotional knowledge and control (Carlson, White, & Davis-Unger, 2014; Moore & Russ, 2008), theory of mind (Jenkins, & Astington, 2000; Taylor & Carlson, 1997), creativity (Hoffmann & Russ, 2016), social skills (Colwell & Lindsey, 2005; Schellenberg, 2004), empathy (Goldstein & Winner, 2012), and language and literacy skills (Nicolopoulou, 2012; Podlozny, 2000).

These claims are made on the basis of several features of DPPGs, although no work that we know of has specified exactly which DPPG activities lead to exactly which types of outcomes. This type of pretend play often happens in pairs or small groups in preschool, involving social interaction. Drama and pretend play usually involve characters and narratives which require children to think about how people interact and create meaning out of behaviors, mental states and emotional reactions (Fein, 1981). When children engage in DPPG, especially physically in their own bodies, they have a chance to practice the emotions, behaviors and mental states of other individuals, who may, in the pretend world, experience situations that the child themselves would

find too frightening or foreign to engage with (Harris, 2000). By engaging with a variety of emotional states in a false, controlled way, with a definite beginning and end, and a clear causal relationship between activity and emotion within the "world" of the activity, children may gain an understanding of the causes and consequences of emotion (e.g., Bretherton & Beeghly, 1989; Elias & Berk, 2002). They therefore acquire improved ability to control emotions in the real world, showing evidence of knowledge transfer from the pretend world to the real world. In DPPG, children may have an opportunity, either alone or by being scaffolding by others, to discuss emotions explicitly and with a frequency that does not happen in the "real world", and this discussion leads to better awareness and then control (Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009). Other work points to the types of natural conflicts and resolutions that come up through dramatic pretend play as teaching real emotional control (Fantuzzo, Sekino, & Cohen, 2004). Finally, by creating symbolic events which arouse emotions, children can then modify such symbolic events to their preferred ends, learning the best way to control emotions through symbolic experiencing (Bretherton, 1989), which is then transferred to the real world, in the way that any kind of rehearsal or practice helps with cognitive and emotional skills. DPPGs therefore may allow for practicing emotional control and social skills in a harmless way that almost no other activity can provide.

However, as analyzed and discussed in multiple recent literature reviews (Durlak et al., 2011; Lillard et al., 2013), most research on the impact of pretend and dramatic play conducted thus far has been problematic in several ways. First, a bona fide randomized control trial of the effects of DPPG has virtually never been conducted (Lee, Patall, Cawthon, & Steingut, 2015). Children often pick their own group, or studies are conducted on children's natural levels of pretend and role play (e.g., Elias & Berk, 2002; Goldstein & Winner, 2012). In addition, control groups are almost never a tightly matched active control in which the non-experimental group engages in activities with components similar to DPPG in a variety of ways—in use of imagination, physical activity, necessity for narrative and character, or group dynamic (e.g., Howard-Jones, Taylor, & Sutton, 2002). Often the researchers engaging in pre and post testing of the play intervention are not blind to the hypothesis of the study, were the same individuals who guided the children through the DPPG, or are not blind to the group the children are placed in (e.g., Dockett, 1998). Children are frequently discretely nested in intervention studies, where every child in a classroom or with a particular teacher receives the same intervention. And finally, pretend play group leaders are often not blind to the hypothesis. Any of these issues individually or in combination have led to questions as to the true causal benefits of pretend play, and whether previously observed changes in quasi-experimental, correlational, and qualitative studies (as well as numerous reports by teachers and parents) are epiphenomenal (Lillard et al., 2013).

The current study therefore aimed to address each of these limitations of the extant literature by tightly controlling for the factors discussed above. We used dramatic pretend play games to engage children in guided, imaginary play in which they employed embodied practice of emotions, and paid close attention the emotional states of others, in a pretend world. We used a component control design (Behar & Borkovec, 2003) to control specifically for the elements of the intervention that are not unique to DPPG. That is, one active control group consisted of building block structures in a group setting, where children had to work together to build a goal structure, and physically place the blocks themselves. This controlled for DPPG's group interaction, fine motor physical movements and goal orientation. A second control group, story time, engaged children in reading and talking about characters, stories and narratives, to control for those aspects of DPPG, but did not involve much physical activity or group goal orientation and interaction. Unique to the DPPG experimental group, then, was the use of embodied characters and emotions, combined with the use of narrative and character, group interaction and goal orientation. Importantly, in all three groups children were directed through the activities, and had constant guidance and supervision from the group leader.

Unlike some interventions in which entire classrooms engage in one type of activity, children were randomly assigned within each classroom to different groups. Other studies have employed non-blind experimenters or intervention group leaders who only focused on one type of play. Here, intervention group leaders were blind to the hypothesis, and did not specialize in one type of group; rather, they taught all three types of group. Experimenters who tested outcomes before and after the intervention period were blind to not only the hypothesis of the study but also which group the children were placed in, and were a separate group of individuals from the intervention group leaders.

To test for a range of social and emotional competencies claimed to be positively affected by DPPG, we used a variety of measures, each focused on an independent but interrelated aspect of social and emotional abilities (i.e., self-management, social awareness, and relationship skills; CASEL, 2013). We tested for social awareness skills including theory of mind and comforting someone in distress; Self-management skills including emotional control through two measures, one in which children react to another's distress, and a self-report of emotional reactivity; and Relationship skills through tests of altruistic behavior and helping behavior. Each of these areas has been theorized and empirically tested to be connected to dramatic pretend play games, therefore it was possible that we would see global gains in social and emotional learning. However, as evidence for causal relationships is inconsistent (Lillard et al., 2013), it is possible that only some areas (e.g., emotional control, which underlies other orientation; Eisenberg et al., 2009) would be positively affected.

2 | METHODS

2.1 | Participants

Participants included 97 children from a federally funded Head Start pre-kindergarten program with maximum income requirements. Children were from six different classrooms, enrolled during the summer months (i.e., June–August) of 2014. Sample size was wholly determined by the number of classroom teachers who allowed the

intervention to take place and the number of parents who consented to their child's participation. We worked with four complete classrooms (two with 19 children, one with 20 and one with 18 children) and one partial classroom of 15 children who were given consent from their parents. Six additional children from a sixth classroom received parental consent for testing, but the teacher did not want to participate in the intervention, so those children did not participate. Every child who was given consent in all available classrooms was included. Institutional Review Board (IRB) approval was obtained by Pace University and consent forms were translated into the native language of the parents with the assistance of native speakers of that language, and approved by the University IRB in English, Mandarin, and Spanish with a school translator working with parents to ensure understanding of consent.

Children were between the ages of 49 and 65 months (4 years, 1 month to 5 years, 5 months) before the 8-week intervention began, with a mean age of 58.17 months (*SD* = 4.01). The sample was 50.5% male and 49.5% female. Parents also completed a demographic questionnaire. Seventy percent of participants (*N* = 68) were reported by their parents as born in the United States, 7.2% (*N* = 7) were reported as not born in the United States, and 22% (*N* = 22) of parents did not respond. Although all participants can be considered low income, as there are income requirements for enrollment in the Head Start program at this location, education was used as an additional proxy for individual student level of SES (Hauser, 1994). Averaging mother's and father's education together, the range was 1 (some high school) to 5 (MA/MBA/MFA). The mean education level was 2.05, just above "High School Graduate", with an *SD* of .99. This Head Start preschool was located in a large city's Chinatown, and a majority of the children were identified by their parents as Ethnically East Asian (46.4% *N* = 45), with 6.2% (*N* = 6) identified as Central or Latin American, 5.2% (*N* = 5) identified as mixed race, 4.1% (*N* = 4) as Caribbean, 3.1%, (*N* = 3) as black, 2.1% (*N* = 2) as Southeast Asian, and one child each identified as European White or Arab.

2.2 | Materials and procedure

2.2.1 | Intervention

Children were randomly assigned, at the child level, to receive one of three different types of guided play intervention. That is, within each classroom, children were randomly assigned to one of the three types of intervention so that classroom was not nested within intervention type. Assignment was conducted through lottery after all consent forms had been collected from parents. Four classrooms were divided randomly into four groups, and each group received the play groups separately. The fifth classroom (with 15 children) was divided into three groups. In each classroom, all three play groups were run simultaneously, with the fourth play group of children randomly assigned by classroom to one of the three types of intervention and run simultaneously. Group leader research assistants conducted three play groups by day, in English: one of each type, changing between classrooms and groups of children for each group. In this way, group leaders were not conflated with intervention type. The entire intervention was 24 sessions, three times per week, 30 minutes each time. Sessions were conducted on Monday, Wednesday, and Thursday mornings for 8 consecutive weeks. Classroom teachers were not involved in the play groups outside of helping group leaders identify which children were part of which play group (i.e., as names were called to form groups), and occasionally helping with classroom management if one child needed individualized attention due to behavioral issues.

Each play group began and ended in the same way: children were first given paper and crayons and told to draw whatever they wanted. At the end of 5 minutes, drawings were collected. This allowed for a transition away from the standard preschool schedule of the day and into the dedicated intervention period. Group leaders then ran the play group for that classroom and that time period. Each group had three "activities/stories" per day, and were different every day. When completed, group leaders gave back the drawings and some stickers for the children to add. The drawings were then collected, if the children were willing to give them to the group leader.

Dramatic pretend play games

The experimental intervention consisted of a set of dramatic pretend and role play games. The 20 minutes of intervention each day consisted of a short easy DPPG activity, followed by two longer and more complex DPPG activities. For example, a first game would be having children walk around the room in different styles: slowly, quickly, as if the ground were sticky, as if they were a baby, as if it were hot, as if it were cold, etc. A second game would be playing "chef" where each child had to take on the role of a chef (with a hat) and prepare a meal for the group leader. Group leaders were told to encourage children to physically enact the games, and to stay on task. A full list of activities and description of each can be found in the Supplemental Materials, Appendix A. Games were created from books and manuals of pretend and drama games for the preschool age group. Please see Goldstein (under revised review) for a full description of the creation of the DPPG manual.

Block building

To control for fine motor physical activity and group interaction, but without a fictional world, character, or narrative, the first control group was a guided block building activity. The 20 minutes of intervention each day consisted of a short and simple build, followed by two guided builds with a complex goal structure in mind, guided by pictures of each major step of the build. An example initial build would be building the tallest tower the children could make. Then, children were given a goal structure to build. Structures were developed in lab and based on the types of structures that come in the pamphlets when boxes of blocks are purchased. Structures included giraffes, trees, birthday cakes, and castles, but never involved people or anthropomorphized animals. Group leaders were carefully instructed to not allow for any narrative or pretend play to emerge during the block play, and to focus fully on the mechanics of building structures. A full list of builds and sample pictures can be found in the supplemental materials, Appendix B.

Story time

To control for the use of narrative, character and story, but not embodiment of character or emotion, group activity and physical motion, the second control group was a guided story time. This story time group was modeled on the reading intervention conducted by Peskin and Astington (2004) and books were chosen from that intervention. During the 20 minutes of intervention, children were read 3–4 different books. Group leaders would stop and ask questions of the children regarding colors, plot, activities, and other aspects of the book and were instructed to not allow for any pretend play or embodiment from the children to emerge during the reading, but to instead focus on the narrative, plot, and characters in the context of the book. The full list of books can be found in the Supplemental Materials, Appendix C. See Table 1 for a summary of the dismantling, active control components.

2.2.2 | Testing

Testing was conducted individually in small rooms by trained research assistants (a separate group from the group leader research assistants) who were blind to condition of the child and blind to the hypotheses of the study. The battery of testing lasted approximately 45 minutes per child. Pre-testing occurred in the week before the first day of intervention, and post-testing occurred in the week after the last day of intervention. Each measure was presented in a random order, by child, with adjustments made to ensure the child did not receive the "Help" or "Responses to Distress" measures (see below) adjacently or first. Children were assented by being told that they would be playing some games with the experimenter, that there were no right or wrong answers, and if they wanted to play, they should place a provided sticker in a square on the child assent sheet. To ensure continued assent and participation, testers were instructed to check in with the child at regular intervals to ensure they wanted to continue. Children who wanted to discontinue testing were allowed to return to their classrooms.

2.2.3 | Outcome measures

Theory of mind

Following Wellman and Liu (2004), we administered a theory of mind scale. This scale consists of six different short vignettes, acted out by the experimenter using small Lego figures, laminated cards, and small props. Each vignette was followed by one or two control questions (to ensure understanding and memory) and one target question, probing the child's understanding of (1) others' desires, (2) others' true beliefs, (3) others' knowledge access, (4) others' false belief, (5) others' emotions based on belief, and (6) others' appearance versus reality of emotional states. Following the standard protocol, the vignettes were presented in different orders at Time 1 and Time 2 (beginning with desire questions at both times, and changing the order of the other five questions). Children were given a theory of mind score based on how many, out of six target mental state questions, they answered correctly. If they failed a control question, they were given a second chance to get it correct, and upon second control failure, were marked as failing that question.

Altrusim

Following Blake and Rand (2010), we administered a sticker "dictator game" to measure children's altruism to a stranger. The experimenter provided two envelopes, one with the child's name on it, and one with the name John/Amy written on it, gender matched to the participant. Children were given eight stickers, and were told that John/Amy really liked stickers, and that any stickers they wanted to give to John/Amy would go into one envelope, and any stickers they wanted to keep, they could put into the envelope with their name on it. After ensuring that the child understood the rules of the game, the experimenter announced she would be busy in another part of the room, to allow the child to make decisions without social influence. Once the child told the experimenter he or she was finished distributing the stickers, the experimenter took the envelope for John/Amy without looking inside and let the child keep their own envelope. The procedure was the same at both time points. Previous work has shown that children in this age group can understand a dictator game and distribute stickers (Blake & Rand, 2010).

Live distress response and comforting

Following Zahn-Waxler, Robinson, and Emde (1992) and others' live hurt protocols, we measured behavioral responses to others' distress in two ways: comforting behaviors to someone in distress, and uncontrolled personal distress behaviors, including becoming visibly upset, freezing, or changing behavior in any way from

TABLE 1 Pairing of dramatic pretend play game intervention and matched active dismantling control interventions

	Drama games	Block play	Story time
Group interaction	Groups of 4, interacting	Groups of 4, interacting	Groups of 4, listening
Narrative/Character	In games	None	In books
Emotions	In some games	No discussion	In some books
Embodiment	Embodied emotions and characters	Embodied actions in building	No embodiment
Guidance	Through games and emotions	For building and placing blocks	Guided reading with questions during books

the behavior of the rest of the testing session. There were two "hurt" protocols, and children received one at Time 1 and one at Time 2, counterbalanced by child. In the "knee" protocol, the experimenter, while reaching to grab a paper, bumped her knee on the table or wall. In the "clipboard" protocol, the experimenter, while fixing some papers, snapped her finger in the clip of the clipboard she was using. She then expressed pain and rubbed her knee or finger for 30 seconds, making noises and expressions of pain, decreasing over the following 30 seconds. The experimenter was careful not to make eye contact with the child. After the 1 minute period, or when the child directly approached the experimenter to ask if she was OK or made another comforting behavior, the experimenter made notes on the child's reactions and coded the child on two dimensions "personal distress" and "comforting". While originally, this measure was scored on a 1–4 scale, to allow for a wider variety of behavior and remain parallel with the comforting and helping scales, personal distress was scored based on how much emotional distress the child seemed to be showing over the course of the minute, with 1 being no personal discomfort and 7 being outward and obvious expressions of sadness, fear, or freezing. Comforting was scored following Hastings, Zahn-Waxler, Robinson, Usher, and Bridges (2000), on how much the child interacted with the experimenter, attempted to comfort her, or attempted to look for some way of distracting the experimenter, such as providing her with a book, or looking for a teacher or outside person to help, with 1 being no attempt to comfort, 4 being some concerned attention and attempt at assistance, and 7 being going to the experimenter, rubbing her finger or knee, asking if she was OK, or providing a book and saying "here, read this, it will make you feel better".

Helping behaviors

Also following Zahn-Waxler et al. (1992), we measured children's tendency to help someone who needed assistance. There were again two protocols, counterbalanced by child between Time 1 and Time 2. The experimenter, reaching for something, knocked over either a pile of notecards or a cup of pencils, and could not reach them. The experimenter made a reaching gesture towards the spilled notecards or pencils, and small noises of distress. The experimenter was again careful not to make eye contact with the child. Once the child helped pick up the items, the task was over. After 1 minute, if the child had not helped, the experimenter picked up the spilled items and continued with the testing session. The experimenter then made notes and scored the child on how quickly and completely they helped, using a 1–7 scoring system (1 = did not help, 4 = helped partially or very slowly, 7 = helped immediately and completely). For all tester ratings (Comfort, Distress, and Helping), coders not only gave a numerical score, but also wrote a few notes on the behavior of the child that led to that score. To ensure fidelity to the coding scale, after their first day of testing, each tester met with the principal investigator (the first author) to discuss the behavior of the children in their session and the score they gave that child.

Emotion matching

To judge how often and in what scenarios children would report that they matched the emotions of another person, we used a Berkeley Puppet Interview Method and asked questions from the Index of Empathy for Children (Bryant, 1982). Because of attention barriers, children were given the first 11 items at Time 1 and the second 11 items at Time 2, with the two practice items each time. Two small dog or fox puppets were used. Children were told that they would be answering some questions about how they thought or felt about certain things, and that two puppets would help them do so. For each item, one puppet would make a statement such as "Seeing a boy who is crying makes me feel like crying", and then the other puppet would say "Seeing a boy who is crying dos not make me feel like crying", and then the experimenter would ask the child, "What about you?" and present both puppets to the child to pick one to agree with. Positive and negative responses were counterbalanced by side and by puppet. Scores could range from 0 to 11 at each time point.

Classroom social behavior

All sessions of all three intervention groups were videotaped, as long as the children in that group had consent from parents to be videotaped. For the first two days of the intervention and the last two days of the intervention, each child was coded in their session using the Social Interaction Observation System (SIOS) (Bauminger, 2002). In this coding protocol, coders watched every other minute of the 20 minute session, for up to 10 minutes. Within each minute, children were coded for the three most salient behaviors that they produced during that time, from a list of "Positive" (e.g., eye contact with smile, sharing objects, giving help), "Negative" (e.g., verbal aggression, avoidance, teasing) and "Neutral" (e.g., looking, imitation, repetitive behavior) social behaviors. A group of five coders, blind to hypothesis, were trained in coding, and coded all videos from all 24 sessions and all groups. A different group of two coders then recoded 20% of the videos. Intraclass correlations were calculated for each of the three subscales (i.e., positive social behavior, negative social behavior, and neutral social behavior) and were all either good or fair (ICC(1,1) = .709, .744 and .539, respectively).

2.2.4 | Covariates

WPSSI Vocabulary Scale

The WPSSI Vocabulary Scale (Wechsler, 2011) was given to all children to be able to control for vocabulary level at baseline, as several of the other measures depended on verbal abilities.

Participation, enthusiasm and attendance

After every group play session, the group leader research assistants marked down which children were present or absent, and scored each child on two 10-point scales, "Participation" and "Enthusiasm". The participation score encompassed how distracted the children were, and whether they left the group to participate in other activities, or whether

they sat on the edge of the group and did not participate. The enthusiasm score measured how engaged the child was in the activity. This was only scored when the child was involved in the activity, encompassing how much they seemed to be enjoying themselves and how much positive affect they expressed. These two scores were considered separately: for example, a child could participate for the entire play group but not be enthusiastic, or a child could participate for only a small amount of time, but be highly enthusiastic while they participated.

2.3 | Data analysis

Analyses were run using 2-level hierarchical linear modeling (HLM; Raudenbush, & Bryk, 2002), employing full maximum likelihood estimation. Students were represented at Level 1. Classroom "subgroups"—indicating the discrete groups of students who participated together in a given intervention within a given classroom—were represented at Level 2; there were 19 total subgroups (seven role play, six each block play and story time), with seven interventionists, and all but one interventionist led all three conditions (the seventh led only one role play group). Examination of univariate indices of skewness and kurtosis revealed no absolute skewness values greater than 1.582 and no absolute kurtosis values greater than 1.298. The mean amount of missing data across all study variables was 7.1%, which is within tolerable limits for HLM using full maximum likelihood estimation (Gallop & Tasca, 2009).

Finally, standard ANCOVA-of-change HLMs (Tasca & Gallop, 2009) were specified to examine our hypotheses, predicting endpoint values for each outcome from corresponding baseline values and a dummy coded variable of condition assignment. Level 2 variance terms (τ) were specified on all intercepts to conservatively account for between-group variation. However, for some outcomes, ICC from Unconditional Models indicated little Level 2 variance (e.g., < .10); these models were re-run without the corresponding τ, which did not affect any obtained effects. Models were run for each outcome with all predictors group mean centered (Enders & Tofighi, 2007). In addition, post-hoc analyses examining correspondence among outcome measures were likewise examined within an HLM framework, following the same parameters as above.

3 | RESULTS

A MANOVA with group as the independent variable and baseline vocabulary level, theory of mind, altruism, live distress response, comforting, helping, and emotion matching as dependent variables showed no significant effect of group at pretest, Wilks' Lambda $F(7, 84) = 0.854$, $p = .61$. Two ANCOVA-of-change HLMs showed that participation in DPPG produced significant decreases in live distress response ($\beta_{01} = -0.947$, $p = .011$; see Figure 1) and child-reported emotion matching during descriptions of others' distress ($\beta_{01} = -0.091$, $p = .030$; see Figure 2) as compared to those in the other two conditions. These effects were robust to covariation of gender, ethnic background, attendance, participation, and enthusiasm. In other words, children who participated in DPPG were more able to inhibit

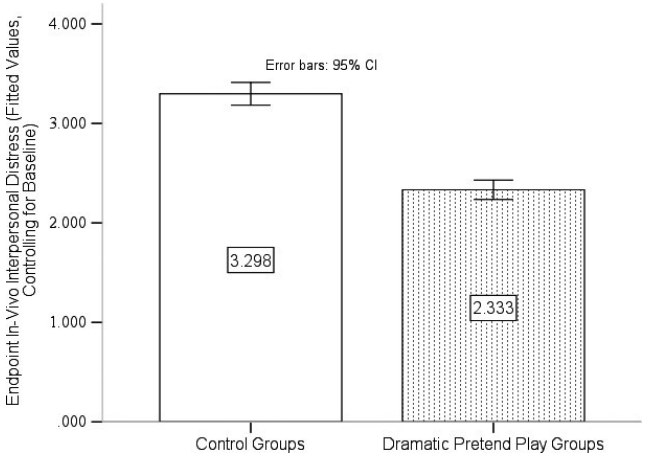

FIGURE 1 Effects of Dramatic Pretend Play compared to active controls (block building and story time) on live distress responses. Y-axis represents post-treatment values controlling for baseline. Results suggest that participation in Dramatic Pretend Play facilitates inhibition of personal distress (rather than, for instance, comforting) response to experimenter distress

their prepotent affective responses to observed or discussed distress than those in well-matched control conditions. Participation in DPPG was unrelated to changes in theory of mind, altruism, social comforting, or helping behavior (all $p > .12$).

In terms of observed social behavior during intervention activities, likewise, children in DPPG showed a decrease in neutral interactions relative to the block play and story time conditions ($\beta_{01} = -11.04$, $p = .03$). No corresponding change was seen in positive or negative interaction (both $p > .11$). That is, children who received DPPG uniquely evinced a relative decrease in their use of minimally interactive social behavior during guided play. While this was different from the pattern of group-level means (Table 2), it represents the difference in individual-level trajectories of change across groups.

To probe these effects, we examined correspondence in change across domains. Decreases in live distress response were related to decrease in negative ($\beta_{20} = .14$, $p = .001$) and increase in positive ($\beta_{20} = -.06$, $p = .027$) peer interaction over the course of the intervention. This indicates that decreases in emotionally dysregulated responding to others on tightly controlled lab-based tasks relate to improvements in rich, successful peer interactions, and decreases in maladaptive interaction in an ecologically valid social context. Changes in the child-reported emotion matching were unrelated to corresponding changes in behavior. Finally, regardless of condition, decreased neutral interaction was associated with increased positive interaction ($\beta_{20} = -.98$, $p < .001$). This suggests that, while not statistically detectable within the DPPG group specifically, children who decreased in neutral interaction generally shifted to positive (rather than negative) interactions.

4 | DISCUSSION

Controlling for gender, ethnic background, attendance, participation, and enthusiasm of engagement in the intervention, we found that

participation in 24 sessions of guided dramatic pretend play games resulted in lowered personal distress across two measures of emotional control as compared to engaging in either guided block play or story time. We also found that engaging in dramatic pretend play games was associated with lower levels of neutral social behaviors over time, and across groups, that lowered neutral behaviors was associated with higher levels of positive social behaviors. Below, we discuss how these findings may be specific to our low-SES population, how our findings on emotional control are related to other findings of pretense activities on social cognitive skills, and executive function, possible future directions to clarify the mechanism and long-term effects of our intervention. Although we did not find gender differences, children, and particularly boys, from low-SES families are often found to be lacking in emotional control and understanding (Hughes et al., 2000; Noble, Norman, & Farah, 2005). The children involved in this study came from a high-risk population, with low average parental education, high levels of English as a second language, and enrollment in a Head Start program with maximum income requirements. There are only a few random control trials on the effects of pretend and dramatic play which include SES as a demographic variable, making this study's population relatively novel (Lillard et al., 2013; McLoyd, 1982). A few extant studies have found that lower-SES children overall engage in pretend play less than middle- and high-SES children, and their play is less sophisticated, while not directly looking at social-emotional effects (Fein & Stork, 1981; Karnik & Tudge, 2010; Smilansky, 1968; Weinberger & Starkey, 1994). When low-SES children are exposed to drama/pretend-based interventions, studies have found improvement in literacy skills and observed self-inhibition as a result of a story-acting intervention in preschool (Nicolopoulou, Cortina, Ilgaz, Cates, & de Sá, 2015), improvement in language as compared to a

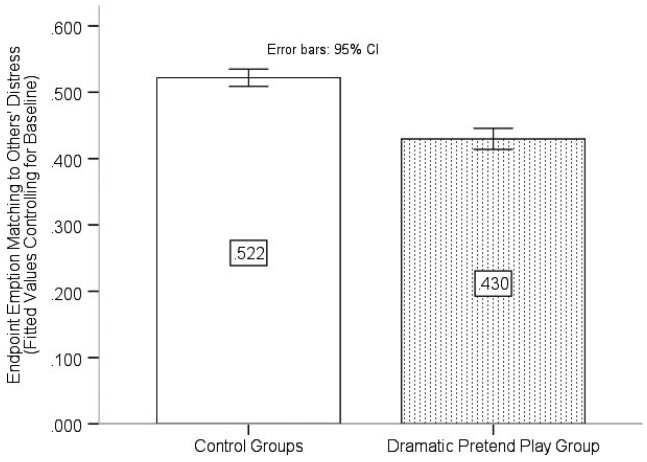

FIGURE 2 Effects of Dramatic Pretend Play Games compared to active controls (block building and story time) on child self-reported emotion matching to others' distress. Y-axis represents post-treatment values controlling for baseline. Results suggest that participation in Dramatic Pretend Play Games facilitates inhibition of child's report that they feel or behave in a distressed manner when they see others who are distressed

TABLE 2 Pre- and post-test mean (and standard deviation) scores for all tests, by group

	Role play		Block play		Story time	
Test	Pre-test (*N* = 31)	Post-test (*N* = 28)	Pre-test (*N* = 29)	Post-test (*N* = 28)	Pre-test (*N* = 26)	Post-test (*N* = 23)
Theory of Mind Scale (Range: 0–6)	3.19	3.82	3.34	4.01	3.61	3.55
Altruism (Range: 0–8)	1.31 (1.69)	1.15 (1.60)	0.89 (1.34)	0.74 (1.31)	1.85 (2.27)	1.35 (2.13)
Personal distress (Range: 1–7)	3.00 (1.67)	2.29 (1.48)	2.69 (1.81)	3.14 (1.94)	3.00 (2.08)	3.65 (1.87)
Comforting (Range: 1–7)	3.24 (2.35)	3.25 (2.50)	2.66 (2.47)	2.71 (2.46)	2.73 (2.25)	2.65 (2.27)
Helping (Range: 1–7)	6.16 (1.75)	5.77 (2.37)	5.17 (2.54)	5.61 (2.37)	5.68 (2.26)	6.22 (1.95)
Emotion Matching (Range: 0–11)	5.09 (1.93)	4.66 (1.78)	6.00 (1.62)	5.80 (1.68)	5.61 (2.24)	5.35 (2.69)
WPSSI	8.84 (7.06)	11.28 (6.10)	8.41 (5.31)	9.89 (6.26)	9.44 (6.73)	7.95 (5.85)
SIOS Positive (Range: 0–100%)	44.70% (10.3%)	37.58% (9.34%)	36.00% (8.69%)	29.76% (7.63%)	27.63% (9.27%)	30.55% (7.26%)
SIOS Negative (Range: 0–100%)	7.63% (6.56%)	3.55% (7.04%)	5.70% (5.64%)	4.41% (6.20%)	5.65% (4.01%)	7.50% (5.86%)
SIOS Neutral (Range: 0–100%)	49.26% (11.08%)	56.11% (7.01%)	58.36% (8.94%)	65.78% (7.86%)	66.60% (8.12%)	61.88% (8.01%)
Attendance (Range: 0–100%)	77% (22.7%)		83% (18.1%)		61% (34.3%)	
Participation (Range: 0–100%)	75% (15.4%)		72% (17.1%)		79% (10.0%)	
Enthusiasm (Range: 0–100%)	78% (11.2%)		71% (14.3%)		77% (11.8%)	

control group in preschool (Smilansky, 1968), improvement in graphic representation of emotional states in kindergarden and 1st grade (Kapsch, 2007), and improvement in reading comprehension as a result of engaging in drama-integrated classes in 4th grade (Rose, Parks, Androes, & McMahon, 2000). The possible positive effects of DPPG, a low-cost, accessible and relatively brief activity, are particularly impactful because of the need for easily disseminated interventions in this population.

Some of the previous work on DPPG, acting experience, and social outcomes more generally has found associations with theory of mind (in adolescence) and empathy (in middle childhood and adolescence; Goldstein & Winner, 2012), which we do not find here. Pretend play engagement (more often than DPPG specifically) has often been connected to social skills broadly, although without strong evidence (Lillard et al., 2013). However, these skills, while interrelated, are distinct capacities (Weissberg, Durlak, Domitrovich, & Gullotta, 2015). It may be, therefore, that increasing understanding and feeling the emotions of another person can only occur after a child is already able to control their own emotional reactions readily and competently. Of note, of course, is that better understanding of others can be used negatively, for example, in bullying (Sutton, Smith, & Swettenham, 1999). Effortful control of emotions has been found, especially in boys, to be predictive of sympathy (Eisenberg et al., 2007). Children who experience more personal distress in response to others' distress have been found to show less prosocial behavior. Emotional control is associated with academic competence (Duckworth & Carlson, 2014), prosocial understanding and behavior (Eisenberg et al., 2009), and behavioral control is associated with lifetime achievement (Moffitt et al., 2011). And feeling personal distress in response to another is less predictive of sympathy and prosociality than feeling empathy for another (Williams, O'Driscoll, &, Moore, 2014). As children develop the ability to gain control over their personal distress starting in infancy, they become more able to appropriately respond to others' emotions and needs (Vaish & Warneken, 2012). Perhaps, like in other studies of at-risk children (Denham et al., 2012; Jones, Brown, & Lawrence Aber, 2011), the participants in this study began with lower than average levels of emotional control, and therefore DPPG helped with that skill, but other social-emotional skills such as theory of mind and compassion could not be affected because the underlying skill of emotional control was not sufficiently developed (see Blair, 2002).

Relatedly, although we did not measure it directly, it is possible is that what was actually being positively affected was not emotional control, but an underlying skill, executive function. Executive function, together with language, has been found to underlie emotional control (Blair, 2002; Zelazo & Cunningham, 2007). It is possible that we were positively affecting attention orienting and inhibitory control through these DPPGs, and therefore emotional control was increasing. In other research, executive function has recently been found to be positively and uniquely affected by fantastical pretend play (Thibodeau et al., 2016). Other work in this age group has shown that when 5-year-old children pretend to be a character (e.g., Batman), or to view themselves in a third person manner, they increase their executive function (White & Carlson, 2015) and perseverance (White et al., 2016). Therefore, these results could have emerged because children in the DPPG group gained an ability to task switch, to distance themselves from emotionally charged situations, to see themselves as separated, and to control their reactions based on their distance from someone else's distress, rather than affecting emotional control directly.

Finally, these results could have emerged because children in the DPPG group could have also been gaining in their fantasy orientation, as a mediating variable to explain our results, which we also did not measure. Children with higher levels of fantasy orientation have more developed emotion regulation skills (Gilpin, Brown, & Pierucci, 2015). And such fantastical pretend play, but not non-fantastical pretend play, is related to executive function (Pierucci, O'Brien, McInnis, Gilpin, & Barber, 2014).

However, we note that while some kinds of activities hypothesized to increase executive functioning, such as switching back and forth between fantasy and reality and remembering pretense rules and inhibiting those rules in real life (Golomb & Kuersten, 1996), were part of the DPPG, other aspects were not. Theoretically, fantasy orientation involves creating pretense situations that are not oriented to reality, and are instead focused on fantastical stories, characters and imaginary companions (Pierucci et al., 2014). Our DPPGs were oriented towards explicitly discussing and portraying emotions, and engaging in pretense around more real-world situations, such as being a chef, or a veterinarian. That being said, there were also games involving more fantastical elements, including walking through various substances (water, molasses) or pretending to be a superhero or an animal. The distinction between fantastical pretense and more "real-world" pretense, and how each type of pretense affects emotional control, is an important direction for future work. We used a variety of games that engaged a variety of skills, some using more or less engagement with emotions and mental states: knowing which elements of which games specifically led to these outcomes is an area for future study. Given that these games were purposefully not tailored to this population, and some were far from the lived reality of inner city low-SES populations (e.g., camping), a different set of DPPGs may have had different effects. Importantly, though, task switching and attention orienting necessary in our control condition of block play, where children had to engage with the direction, the blocks, and the group leader, may have led to higher executive function, but we did not find parallel improvements in emotional control in this group.

4.1 | Limitations

There are several important limitations that restrict the scope of conclusions that can be drawn from these findings. The first is that we were unable to collect any longitudinal follow-up data. Post-tests occurred within one week of the end of the intervention, but we were unable to collect any other data on children's abilities past that date, making us unable to investigate how long these effects may last or how quickly they fade, and therefore to test the cost–benefit of the dramatic pretend play games. We also did not have a direct measure

of emotional control or executive function, which would have allowed for a clearer results and higher ecological validity on those outcome findings. We did not directly test for pretense level or ability in the children's natural pretend play, and therefore are unable to look for individual/pre-existing differences in fantastical orientation, pretense ability, or talent or abilities on the DPPGs themselves. The current study does not look at the influence of parents or teachers, nor did it provide lessons or intervention for parents and teachers to follow, both of which have been shown as important in previous interventions (Bierman & Motamedi, 2015). In the intervention groups themselves, to keep the group leaders blind to hypothesis, we did not prevent them from encouraging or discouraging prosocial interaction in the control conditions, so we cannot separate that possibility. While the group leaders were blind to the hypotheses of the study, they may have had their own hypotheses about the effects of the interventions, given the culturally available idea that pretend play helps children. Likewise, ideally, future iterations of this intervention could use exemplars to train leaders as they run groups, and then film group leaders throughout to test for adherence to the intervention, and affect of the group leaders across groups. Finally, in the current study, we do not report on the feasibility for the scalability of the intervention; such study is necessary for replication and further evidence of efficacy.

5 | CONCLUSIONS

We found evidence that for low-SES 4-year-old children, dramatic pretend play games can be a tool for increasing emotional control skills. Future work should investigate how acting and DPPG as a targeted intervention can be used at varying levels of intensity, duration and depth for varying levels of cognitive and emotional capabilities dependent on age group and situation. We do not yet know if the developmental concordance proposed here yields a similar pattern of effects for pretend and drama across childhood and adolescence, as previous work has been correlational or quasi-experimental in nature. Teachers of acting and creative dramatics have long theorized and discussed how teaching acting and theatrical techniques can differentially focus on emotional control, orientation to others, feeling and understanding others, or thinking about problems and injustice on a larger societal scale (Gunkle, 1963; Levy, 1997; Nicholson, 2014) but have not conducted experimentally rigorous research (Goldstein, Lerner, & Winner, 2017; Winner, Goldstein, & Vincent-Lancrin, 2013).

Similarly, previous work analyzing the body of pretend play research literature has called for more carefully controlled studies so that the causal effects of pretend play at a variety of ages and with a variety of populations can be carefully examined (Lillard et al., 2013). Here we present precisely such a study of children's play, in which the group leaders guiding the play were not involved in the testing, and were blind to hypothesis, the experimenters involved in the testing were blind to group and hypothesis, the control groups represented active and plausible alternative conditions, and the children involved in the study were randomly assigned to type of play at the child, rather than classroom level. To our knowledge this is the first study to use a well-controlled approach to studying this phenomenon and to find effects. Importantly, these effects emerged against specific contrasts with active control conditions that accounted for non-embodied, non-dramatic elements of dramatic pretend play games, such as group interaction, narrative and character, goal orientation and physical action.

How can we best build children's social and emotional understanding and skills? It may be that for different age groups and population demographics, the wide variety of constructs that make up social-emotional development need to be targeted individually: understanding others' emotions, feeling their feelings, and controlling the self discretely. Emotional control is one such construct, and may underlie positive and prosocial social behavior and orientation (Eisenberg et al., 2009). By positively affecting emotional control in a preschool population, children will be helped to control their reactions to others, and may therefore behave in more positive social manner.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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