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THE RELATIONSHIP BETWEEN TEMPERAMENT AND PRETENSE IN YOUNG PRESCHOOLERS*

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Abstract

Many social and social-cognitive factors, including relationship quality and understanding of minds, are known to influence the amount and quality of children's early pretend play, but it is not known whether personality plays a role in pretense development. This study explored the relationship between temperament and pretense ability in young preschoolers. Children's ($N = 41$) temperament and pretense was assessed near their 3rd birthdays using both parent report and laboratory behavioral measures. Approximately 50% of the participants were reassessed on all measures within a year. Results indicate that early high negative affect was associated with higher quality pretend play at Time 2, but early self-regulatory abilities were not related to later pretense. However, early pretense was positively related to later self-regulation. Implications of these findings, including the possibility that pretense is a coping mechanism and that pretense helps facilitate self-regulation, are discussed.

The ability to pretend and understand others' pretense is an important and remarkable milestone in early cognitive and social development. Cognitively, it is a sign of children's growing representational ability and symbolic competence. Socially, it is a tool children can use to communicate with and enter into playful interactions with other people, including parents, siblings, and peers. In normal development, pretending emerges sometime in the second year of life (Haight & Miller, 1993), seemingly effortlessly, without explicit instruction, and independent of experience. Children's early pretense is relatively simple, reflecting scripted actions (e.g., eating) and relying heavily on concrete objects. However, this simplicity disguises the cognitive sophistication required for even basic pretense: every pretend action or thought requires a child to represent both reality and an alternative state of reality. Further, it is necessary for the child to keep the two states separate so that they do not confuse them and come to believe the pretend state is real (Leslie, 1987). With age, children's pretense becomes more complex and less tied to reality. Children become able to create imaginary objects, begin involving fantastical elements into their pretense, and engage in sustained episodes of pretense involving others, called socio-dramatic play (Haight, Wang, Fung, Williams, & Mintz, 2003).

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Of course this basic developmental timeline of pretense is not the whole story. Research has also identified several individual differences, factors that can accelerate or delay this timeline and allow some children to be better pretenders than others. Much of this research has centered on social characteristics. For instance, children's attachment relationship with their caregivers has been shown in several studies to relate to how much pretend play children engage in and how advanced that play is. McElwain and colleagues (2003) found that toddlers with secure or avoidant attachments pretended more than resistant/ambivalent attached toddlers during solitary play. Slade (1987) found that secure attachment status was positively related to several measures of pretend quality, like how sustained and organized pretend episodes were (but not total amount of pretend play) in children near their second birthdays. Observations of mothers' interactions with their children in play revealed that securely attached mothers were more involved and engaged, leading to the hypothesis that securely attached children show higher quality pretense in part because their mothers scaffold their play. Similar effects have been found with fathers (e.g., Farver & Wimbarti, 1995) and non-familial adults (e.g., Meins, Fernyhough, & Russell, 1998). Older siblings also appear to increase the quality of their younger siblings' pretense. The older the sibling, the greater the effect: pretense quality has been found to be positively correlated with the age difference between a child and their sibling play partner. Like parents' influence on pretense, higher quality sibling relationships are associated with higher quality pretense (Youngblade & Dunn, 1995).

Pretend play is also known to be associated with children's peer interactions and social behavior. Children's pretense is typically of higher quality with friends than with familiar or unfamiliar peers (Werebe & Baudonnière, 1991). Friends who engage in pretense more often are less likely to be in conflict; in other words, the quality of their friendships is typically higher (Dunn & Cutting, 1999). Howes and Matheson (1992) found that preschoolers who engaged in more cooperative and complex social pretend play had a variety of positive social skills, like more prosocial behavior, less withdrawal, and less hostile aggression. In 5- to 7-year-old children, sophistication and complexity of pretend play has been found to be positively correlated with social competence (Uren & Stagnitti, 2009).

Given these many links with social behavior, it is unsurprising that pretend play has been repeatedly linked with theory of mind ability, or children's understanding of people's mental states, emotions, and behaviors. A number of studies have confirmed that good pretenders demonstrate more emotional understanding, are more able to take others' perspectives (Youngblade & Dunn, 1995), are more likely to pass false belief tasks (Astington & Jenkins, 1995), and engage in more mental state talk with friends (Hughes & Dunn, 1997). In fact, some researchers have even used pretense as an assessment of early theory of mind ability (e.g., Carlson, Mandell, & Williams, 2004).

Thus, the development of children's pretend play is known to be associated with several major social and social cognitive factors, including parent-child attachment, presence of siblings and sibling relationship quality, peer competence, and theory of mind understanding. However, the potential influence of another key individual difference—temperament—has not yet been studied. Temperament is a group of “early emerging basic

dispositions in the domains of activity, affectivity, attention, and self-regulation” (Shiner, Buss, McClowry, Putnam, Saudino, & Zentner, 2012, p. 437). One common method for characterizing a child’s temperament, which the present research will employ, is a system developed and validated by Rothbart and her colleagues which not only measures many aspects of temperament but also groups them into three main dimensions: negative affect, surgency, and effortful control (Putnam & Rothbart, 2006; Rothbart, Ahadi, Hershey, & Fisher, 2001). Children who have temperaments characterized by high negative affect show high levels of discomfort, sadness, fear, and anger as well as low levels of soothability. In other words, these children tend to be fearful of novel people and situations, highly sensitive to stimuli like light and sound, get frustrated easily, and have trouble regulating their emotions or calming themselves down. Extraversion/surgency is defined as high impulsivity, activity level, intense pleasure, and anticipation with little shyness. Children with high levels of surgency are very active, like to engage in intense and novel activities, get easily excited, smile and laugh frequently, and show little restraint. The final dimension, effortful control, is defined by high attention, ability to follow directions, pleasure for low intensity activities (e.g., reading), and sensitivity to changes in one’s environment.

It is not known whether temperament influences the trajectory of children’s pretend play development. However, there are several reasons to hypothesize it might. A child’s temperament helps dictate how s/he will approach and react to novelty. Children high in negative affect tend to be wary of people they do not know, places they have never been, loud noises, and unusual objects. Engaging in pretense can be similar to engaging with novelty. Imagining a situation which does not exist or thinking about going somewhere you have never been are ways of bringing novelty into one’s present. Children who are fearful of novelty may choose not to engage in a non-reality as frequently as children to enjoy novelty. As a result, they would not get as much experience pretending and might perform worse on assessments of their pretense ability. Thus, there may be a negative relationship between children’s negative affect scores and their ability to pretend.

However, it also could be that high negative affect fosters pretend play. Recent research has shown that certain aspects of temperament predict preschoolers’ theory of mind understanding (Wellman, Lane, LaBounty, & Olson, 2011). Specifically, high shyness-withdrawn scores, high perceptual sensitivity scores, and low aggression scores were associated with earlier theory of mind understanding. Considering that pretense and theory of mind understanding are highly positively related in early childhood, it is plausible that a similar relationship exists between temperament and pretense. For children who are frequently shy or fearful, pretense may allow them to cope with their anxieties. In pretense, children could create a safe, controlled environment in which to explore their fears. In fact, research has linked imaginative play with positive coping strategies in elementary-age children (Goldstein & Russ, 2000–2001).

There is also reason to expect a positive relationship between the dimension of effortful control and pretense. Creating and representing something unreal is not a simple mental task; it takes considerable effort and focus, likely requiring children to have good control over their mental processes. Again, research on theory of mind supports this hypothesis. For one, Wellman et al. (2011) found that one aspect of effortful control—perceptual sensitivity

—predicted early theory of mind understanding. In addition, there is a wealth of evidence showing high inhibitory control, a cognitive process which allows children to exert control over their thoughts and behaviors and one component of effortful control, is positively correlated with theory of mind understanding in preschoolers (e.g., Carlson & Moses, 2001; Hughes, 1998). Inhibitory control is hypothesized to be important in theory of mind understanding because understanding others' mental states requires setting aside, or inhibiting, one's own mental state, allowing a child to represent both their own state and someone else's without confusing the two. Pretense, in which children have to represent both reality and an alternative state of reality, is theoretically very similar. Thus, if effortful control and inhibitory control are key to theory of mind understanding, it is reasonable to expect they will be influential in children's ability to pretend.

In addition, the distinction between conflict and delay inhibitory control has proven to be important in understanding the nuanced relationship between inhibitory control and theory of mind (e.g., Carlson & Moses, 2001). Specifically, theory of mind performance is more strongly correlated with conflict inhibitory control than delay inhibitory control (e.g., Carlson, Moses, & Claxton, 2004). Conflict inhibitory control is utilized whenever one has to manage differing responses, as in the classic Stroop task when participants have to inhibit their natural response to read a word in order to make the unnatural response of reading the color of the word. Delay inhibitory control is required whenever one has to wait or delay gratification. Although the two are clearly related (i.e., waiting is sometimes an unnatural response), the conflict sub-type is thought to better capture the switching component of executive function. In order to determine whether the relationship between inhibitory control and pretense is similarly nuanced to the one with theory of mind, tasks assessing both sub-types were included in the present research.

The goal of the current study is to test whether temperament plays a role in the development of young preschoolers' ability to pretend. In order to explore the relationships among the various dimensions of temperament and pretense, these abilities were assessed at two time points. This longitudinal design will not only allow examination of the relationships between temperament and pretense at each time point, it will allow a test of whether early temperament predicts later pretense. Given the fact that there are plausible explanations for both a positive (e.g., coping) and a negative (e.g., fear of novelty) correlation between pretense and negative affect, no a priori prediction is made for this relationship. However, a positive relationship is expected between pretense and effortful control. Effortful control was assessed using both behavioral measures of inhibitory control and a parent questionnaire in order to obtain a complete picture of children's self-regulatory abilities and in order to test whether pretense is related to self-regulation generally or just specific aspects of it.

METHOD

Participants

Children were recruited from databases of families interested in research and from parents who responded to online and print advertisements. Forty-one children between the ages of 35 and 40 months ($M = 37.9$, $SD = 1.6$) participated. The sample was 51% female. The

majority of participants were Caucasian (80%) and had well-educated parents (37% reporting some college or a Bachelor's degree and 59% reporting some graduate school or a graduate degree). Two participants declined to give demographic information. Informed parental consent was obtained for all participants. Parents received \$10.00 and children received a prize for their participation.

Approximately 7 months after the initial testing date, participants were contacted by phone or e-mail about participating in a follow-up visit. Nineteen families agreed and participated. Children who participated in the second assessment averaged 44.6 months old ($SD = 3.1$) and shared the same demographic characteristics as the original sample (53% female, 84% Caucasian, 37% some college/college degree, and 58% some graduate/graduate degree). Informed parental consent was again obtained, and both parents and children were again compensated with \$10.00 and a prize, respectively.

Materials and Procedure

Parents were asked to complete the short form version of the Children's Behavior Questionnaire (Putnam & Rothbart, 2006). This survey contains 94 items presented on a Likert scale ranging from 1 to 7. Each item describes a trait or behavior and parents are asked to rate how well the description fits their child. Fourteen aspects of temperament are assessed by this questionnaire, which can be collapsed into the three larger dimensions: negative affect, surgency, and effortful control. The scores for negative affect and effortful control, along with their corresponding sub-scales, were calculated for each child in accordance with instructions provided by the questionnaire's authors. Since no theoretical link between surgency and pretense was identified, these scores were not calculated or analyzed. Many parents completed the questionnaire while their child was being tested. However, some parents chose to complete the questionnaire at home; these parents were provided with a stamped, addressed envelope. Two parents did not return questionnaires despite several reminders at Time 1. All questionnaires were completed at Time 2.

All children were tested individually in a quiet laboratory room. After obtaining verbal assent, children were asked to sit across from the experimenter at a child-sized table. Following standard practice in correlational studies, tasks were completed in a single, fixed order for all participants (e.g., Carlson & Moses, 2001). The same procedure was used at both the initial and follow-up visits. All visits were videotaped and coded by two trained research assistants. Disagreements were resolved by a third coder.

Children first completed a warm-up picture naming task to ensure they were comfortable with the experimenter and the testing environment. Then, inhibitory control and pretense tasks were given in the following order: Grass/Snow, Pretend Snack, Delay of Gratification, Head-to-Toes, Impersonation Interview, Pretend Actions, Gift Delay. All tasks were chosen because they have been previously shown to be valid and reliable for 3- and 4-year-olds (e.g., Carlson, 2005). Each task and its scoring are described below.

Pretense Measures

For the Pretend Snack task, two small plastic bowls, two small plastic cups, and one plastic pitcher were stacked and placed in the center of the table. Children were asked to show the experimenter “how to pretend to have a snack.” The experimenter participated by imitating the child’s actions when appropriate, responding to the child’s actions appropriately, and asking questions if an action was unclear, but the experimenter never suggested any actions. For example, if the child pretended to drink, the experimenter would copy that action. If the child pretended to pour something into the experimenter’s cup, the experimenter would say “thank you” and then ask what was in the cup. In the rare event that the child did not respond to the experimenter’s initial prompt, the prompt was repeated. When the child stopped pretending, the experimenter always asked, “Is there anything else we can do to pretend to have a snack?” The task ended when the child responded “no” to this question. Children received a score of 0–3 in this task: 0 = no pretense (e.g., just stacking or reorganizing objects), 1 = limited pretense (e.g., just performing one pretend action like drink), 2 = pretense relying only on objects available (e.g., eat, drink, and pour), 3 = elaborated pretense (e.g., creation of imaginary objects like utensils, using a prop as multiple items like mixing bowl and then soup bowl, going beyond the standard snack script).¹

The Impersonation Interview was a modified version of Singer’s IPP (Sharon & Woolley, 2004). Children were asked in turn if they ever pretend to be an animal, a different person, and a machine. If they said yes, they were asked to provide an example and demonstrate the pretense for the experimenter. Scores on this task could range from 0–9. Within each category (animal, person, machine), 1 point was awarded if children could provide at least one example and 2 points were available for demonstrating the pretense: 0 = no pretense and no description (e.g., “I don’t remember how”); 1 = only or mostly verbal description (e.g., “I crawl on the floor and say “meow, meow”), 2 = full demonstration of pretense.

For the Pretend Actions task (Elder & Pederson, 1978; Taylor & Carlson, 1997), children were asked to show the experimenter how to pretend five common actions: draw a picture, brush their teeth, comb their hair, cut with a knife, and talk on the phone. No props were available. Children were given 1 point each time they created an imaginary object instead of using a body part as object substitute. For example, 1 point was given to a child who pretended to hold a toothbrush and no points for a child who pretended their index finger was a toothbrush. Thus, the possible range for this task was 0–5.

Inhibitory Control Measures

Grass/Snow and Head-to-Toes assess the conflict sub-type of inhibitory control because they both require children to stop a natural response in order to make an unnatural one and switch back and forth between two unnatural responses. For Grass/Snow (Carlson & Moses, 2001), a yellow mat with one green and one white rectangle was placed in front of the child. To

¹A number of other dimensions of children’s behavior in this task signaling pretense quality were coded, including number of pretend actions performed, number of unique pretend actions, amount of time children were able to sustain the episode, and number of experimenter prompts needed. However, analyses revealed that these fine-grained measurements were all highly correlated with the overall 0–3 rating. Since these measurements did not add any useful information, they were excluded from the final data analyses in favor of the simpler rating.

confirm children knew the natural association, they were first asked to touch the color of grass and then the color of snow. The experimenter then instructed children to touch white when s/he said “grass” and green when s/he said “snow.” After several practice trials with feedback, children were given 12 test trials, 6 grass and 6 snow, in a random order without feedback.

The Head-to-Toes task (Cameron, McClelland, Jewkes, Connor, Farris, & Morrison, 2008) was conducted similarly. Children were asked to stand up and make the natural association by touching their head once and their toes once. They were then instructed to do the opposite: to touch their head when the experimenter said “touch your toes” and vice versa. Again, several practice trials with feedback were given before 12 test trials (6 head and 6 toes in a random order without feedback). Both Grass/Snow and Head-to-Toes were scored by calculating the proportion of correct responses out of 12. Only children’s first response was counted.

Delay of Gratification (Mischel, Shoda, & Rodriguez, 1989) and Gift Delay (Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996) assess the delay sub-type of inhibitory control. They both require children to wait before performing a natural response. In Delay of Gratification, children were shown two clear plastic bags, one with Cheerios and one with raisins, and asked to choose which they wanted. As the experimenter narrated, the children watched him/her pour out the chosen food onto a plate, divide the food into a “small” pile (4 pieces) and a “big” pile (12 pieces), and push the piles to opposite sides of the plate, making sure each pile was equidistant from the child. Next, the experimenter said s/he needed “one more thing” before the game could begin and pretended to look in a box on the floor for approximately 15 seconds. Then, feigning embarrassment, the experimenter told the child s/he left the thing in another room and had to go get it. Children were asked to stay seated at the table and wait for him/her to return. They were told if they waited, they could have the big pile of food, and if not, they could only have the small pile. After confirming children remembered the rules, the experimenter left for 3 minutes. Upon returning, children were allowed to eat the appropriate pile of food (if they had not already). Because children’s responses were bimodal—they either waited the entire time or less than 20 seconds—this task was scored categorically (0 = did not wait, 1 = waited entire time).

Before the Gift Delay task, the experimenter announced she was all out of games and it was time for the child to get a prize. As in the Delay of Gratification task, the child watched the experimenter look into the box on the floor and then look back at the child in embarrassment. The experimenter explained s/he forgot to wrap the gift and asked whether the child would close his/her eyes while the gift was wrapped. When the child complied, the experimenter gave the instruction “Don’t peek!” then noisily wrapped the prize with tissue paper for 60 seconds. Again, children’s performance was scored categorically, as either correct (never peeked) or incorrect (peeked at some point).

RESULTS

Time 1

Overall scores for pretense, conflict inhibitory control, and delay inhibitory control were created by summing the individual task scores within each category. Because the three pretense tasks were each worth a different amount of points, scores were converted into proportions before they were summed; thus, total pretense scores could range from 0–3 (see Table 1 for descriptive statistics). Preliminary analyses indicated that age in months was unrelated to any of the variables, so it will not be considered further. However, several gender differences were found. Girls had higher pretense ($M = 1.12$, $SD = 0.67$) and effortful control scores ($M = 5.43$, $SD = 0.62$) than boys ($M = 0.63$, $SD = 0.6$ and $M = 4.93$, $SD = 0.59$), $t(39) = 2.46$, $p = .02$, *Cohen's d* = 0.77 and $t(37) = 2.54$, $p = .02$, *Cohen's d* = 0.82. No gender differences were found for negative affect, conflict inhibitory control, or delay inhibitory control scores.

The main question of interest was whether either negative affect or effortful control, two dimensions of temperament, were correlated with pretending ability (see Table 2). No relationship was found between negative affect and pretense ($r = .19$). As predicted, effortful control was positively correlated to pretense ($r = .36$, $p = .03$). To explore this significant correlation further, pretense scores were next correlated with the sub-scales associated with effortful control. Effortful control is the combination of the following four sub-scales: inhibitory control, low intensity pleasure, perceptual sensitivity, and attentional focusing. All the correlations between these sub-scales and pretense were positive, but only the relationships with inhibitory control ($r = .31$, $p = .05$) and attentional focusing ($r = .34$, $p = .03$) were significant. This pattern suggests that the traits traditionally considered to be executive functions are more related to pretense ability than the other aspects of effortful control.

A second goal of this study was to compare the relationships between the behavioral measures of inhibitory control and pretense to the relationship between the temperamental dimension of effortful control and pretense. Pretense scores were positively correlated with conflict inhibitory control performance, $r = .41$, $p = .01$. Examining the two conflict inhibitory control tasks individually, Grass/ Snow was not significantly related to pretense scores ($r = .19$) but Head-to-Toes performance was ($r = .43$, $p = .003$). Lastly, pretense scores were uncorrelated with delay inhibitory control performance ($r = .20$, $p = .22$). These correlations reveal that the relationship between inhibitory control and pretense is not general; it is specific to the mental process of managing two conflicting representations and not the ability to wait and/or delay gratification.

Time 2

The 19 children who participated in the second testing did not differ from the non-returning children from the original sample on either dimension of temperament (negative affect: $t(37) = 0.36$, $p = .72$, effortful control: $t(37) = 0.80$, $p = .43$) at Time 1. Paired-samples t tests also confirm that the returning children's Time 2 scores did not differ from their own Time 1 scores (negative affect: $t(17) = 1.14$, $p = .27$, effortful control: $t(17) = 1.25$, $p = .23$). And,

their Time 1 and Time 2 scores were positively correlated with one another (negative affect: $r = 0.43, p = .075$, effortful control; $r = 0.87, p < .001$). These results not only confirm that the CBQ is a reliable measure of children's temperament, it alleviates any concern that the children who participated in the Time 2 follow-up differed from the original group in terms of temperament.

For the behavioral measures, children who returned for the Time 2 testing did not differ from non-returning children on conflict inhibitory control ($t(37) = 0.26, p = .79$) or pretense ($t(37) = 0.36, p = .75$) at Time 1. However, they had significantly higher delay inhibitory control scores at Time 1 ($t(37) = 2.18, p = .04$). Unsurprisingly, returning children's scores on the three batteries at Time 2 were significantly higher than their scores at Time 1 (conflict inhibitory control: $t(18) = 3.47, p = .003$; delay inhibitory control: $t(17) = 2.65, p = .02$; and pretense: $t(18) = 2.66, p = .02$), showing the expected gain in all three of these abilities.

For all subsequent analyses involving Time 2 data, mostly one-tailed tests and a less conservative Type 1 error rate were used ($\alpha = .10$). Because the sample size at Time 2 was considerably smaller than Time 1, highlighting only correlations with two-tailed p values less than .05 would overlook several medium-sized correlations, some which replicate the magnitude of relationships found at Time 1. Thus, all correlations with at least a medium effect size (i.e., with absolute value greater than .30) will be reported with the caveat that given the exploratory nature of this work, the small sample size, and the more liberal analyses, effects should be interpreted cautiously.

Pretense was again positively correlated with effortful control ($r = .33, p = .08$, one-tailed). Examining the four effortful control sub-scales, pretense was again correlated with attention ($r = .37, p = .06$, one-tailed) but unrelated to the inhibitory control, low intensity pleasure, and perceptual sensitivity sub-scales. Unlike Time 1, pretense was not correlated with conflict inhibitory control performance, but it was positively correlated with both negative affect ($r = .33, p = .08$, one-tailed) and delay inhibitory control ($r = .49, p = .03$). Examining the five negative affect sub-scales, three of them revealed positive correlations with pretense: discomfort ($r = .38, p = .05$, one-tailed), fear ($r = .60, p = .01$), and sadness ($r = .31, p = .10$, one-tailed). Anger/frustration and soothability were not associated with pretense. Both measures of delay inhibitory control were correlated with pretense (Delay of Gratification: $r = .38, p = .05$, one-tailed; Gift Delay: $r = .32, p = .09$, one-tailed).

Relationships between Time 1 and Time 2

One objective of this study was to see whether young children's early temperament or self-regulation would relate to their later pretense. Unsurprisingly, pretense scores at Time 1 were positively correlated with pretense scores at Time 2 ($r = .33, p = .08$, one-tailed). The only other Time 1 variable which was associated with Time 2 pretense scores was negative affect ($r = .47, p = .04$); children with high negative affect at Time 1 had better pretense scores at Time 2. Again, this correlation was driven by the discomfort ($r = .31, p = .1$, one-tailed), fear ($r = .40, p = .04$, one-tailed), and sadness ($r = .49, p = .03$) sub-scales, and unrelated to the anger/frustration and soothability sub-scales. Early effortful control, conflict inhibitory control, and delay inhibitory control, were unrelated to later pretense.

In contrast, children's early pretense predicted two Time 2 scores. Early pretense was positively correlated with Time 2 effortful control ($r = .41, p = .04$, one-tailed) and conflict inhibitory control ($r = .40, p = .04$, one-tailed) scores. Examining the sub-scales of effortful control, it seems this relationship between early pretense and later effortful control was driven by attention and inhibitory control (both $r_s = .42, p_s = .04$, one-tailed); the correlations with low intensity pleasure and perceptual sensitivity were positive but quite small. Lastly, early pretense was correlated with both individual measures of conflict inhibitory control, Grass/Snow ($r = .36, p = .07$, one-tailed) and Head-to-Toes ($r = .35, p = .07$, one-tailed).

DISCUSSION

The goal of this research was to explore the concurrent and predictive relationships between temperament and young preschoolers' developing pretense abilities. To do this, children's pretense, inhibitory control, and temperament were assessed at their 3rd birthdays and again several months later. No directional prediction was made concerning the relationship between pretense and negative affect, but positive correlations were hypothesized between effortful control and pretense and inhibitory control and pretense. These relationships will be discussed in turn.

Negative Affect

Some evidence for a positive relationship between pretense and negative affect was found. There was no relationship between the two at Time 1, but a moderate, positive correlation was found at Time 2. While early pretense was not related to later negative affect, early negative affect was strongly positively related to later pretense ability. Delving deeper into the two significant relationships revealed a consistent pattern: pretense was positively related to levels of discomfort, fear, and sadness but not anger/frustration or soothability. These findings are comparable to the relationship found by Wellman and colleagues (2011) that preschoolers' shyness-withdrawn scores predict their theory of mind ability. In that study, the authors hypothesized that shy-withdrawn children are more likely to be wary of, and thus more intensely observant of, others' interactions and emotions, leading to advanced theories of mind. In the present study, children who are uncomfortable, fearful, and/or sad may be more likely to engage in pretense as a way to escape from, or perhaps deal with, these negative emotions. This hypothesis fits with extant research showing that pretense is related to coping in older children (Goldstein & Russ, 2000–2001).

Exploring whether this is true, whether young children with high negative affect indeed use pretense to cope with their negative emotions more than their peers is an interesting and important question for future research. If it is true that pretense is being used as a form of coping, it would then be crucial to determine whether it was an effective strategy. That is, does pretense reduce children's distress? In the present research, there was a medium-to-large correlation between children's first and second negative affect scores, indicating that children who were originally high in negative affect remained so. This hints that better pretense ability does not reduce overall, trait-level negative affect. However, it remains to be

seen whether pretense might help children temporarily or in specific situations in which children become fearful or sad.

Of course it is possible that the observed relationship between negative affect and pretense has nothing to do with coping. Another explanation is that children with high negative affect engage in more or in different types of pretend play than their peers. Perhaps they choose more solitary play and less social play, given their wariness of people and social interactions. For the same reason, perhaps they are more likely to play with the familiar adults in their lives, like their parents and babysitters, and thus were simply more comfortable pretending with an adult experimenter than the other children were, leading to higher pretense scores.

Although the present study cannot speak to exactly why 3-year-olds with high negative affect became better pretenders than children with low negative affect, it is an intriguing finding. Importantly, it is the first indication we have that an aspect of temperament can influence the trajectory of early pretense development.

Inhibitory and Effortful Control

Children's self-regulation was assessed in three ways, through the temperamental dimension of effortful control and behavioral measures of both conflict and delay inhibitory control. Examining the relationships among the three self-regulation constructs reveals that delay and conflict inhibitory control scores were only correlated once, a positive relationship at Time 2. This irregularity is consistent with many studies, which sometimes find positive correlations between tasks measuring the two constructs and sometimes do not (e.g., Oh & Lewis, 2008). Conflict inhibitory control was consistently positively correlated with effortful control, but delay inhibitory control was never correlated with effortful control. This shows that the temperamental construct of effortful control captures conflict inhibitory control ability rather well, but does not assess the ability to wait or delay gratification. This is relatively unsurprising considering that inhibitory control is one of the component sub-scales of the effortful control dimension, but delay inhibitory control is not explicitly measured by any of the CBQ sub-scales. Nevertheless, given that the two terms are sometimes used interchangeably, it is important for researchers interested in preschoolers' self-regulation to realize that the temperament construct of effortful control is not identical to the cognitive construct of inhibitory control.

Having three different assessments of children's self-regulation allowed a nuanced examination of how self-control is related to pretending. Both effortful control and conflict inhibitory control were positively correlated with pretending ability at Time 1, but only the correlation with effortful control remained significant at Time 2. The only significant relationship between delay inhibitory control and pretense was at Time 2. Looking longitudinally, while early pretense was positively related to both later effortful control and conflict inhibitory control, the reverse was not true for either ability: early effortful control and conflict inhibitory control were not related to later pretense. This pattern of relationships suggests that pretense underlies children's abilities to control themselves, but self-control does not contribute to the ability to pretend.

The fact that pretense predicted self-control, not the reverse, may mean that engaging in pretense strengthens young children's self-control. That is, pretending possibly serves as self-control practice. It is important to note that this proposed link between play and self-control is not a new or novel idea; Vygotsky's theory of development stressed the importance of social pretend play for the development of self-regulation (Vygotsky, 1978). However, few studies have adequately tested the hypothesis. One notable exception is Elias and Berk (2002), who observed 4- and 5-year-olds' socio-dramatic play and self-regulation (at circle and clean-up times) in their preschool classrooms twice. The main finding from this study was that complex socio-dramatic play predicted better clean-up behavior at the second observation 4 months later. Thus, as in the present research, early play predicted later self-regulation, but not vice versa. More recently, a preschool curricula based on Vygotsky's ideas, including the importance of dramatic play, called *Tools of the Mind*, was found to increase children's executive function ability (Diamond, Barnett, Thomas, & Munro, 2007). Taken together, these studies do suggest that pretend and/or dramatic play has a role in facilitating children's self-regulation. However, more research is needed which a) tests pretend play generally and does not focus exclusively on socio-dramatic play, and b) involves explicit training or intervention focused entirely on pretend play, not multiple skills.

The fact that pretense predicted later conflict inhibitory and effortful control but conflict inhibitory and effortful control did not predict pretense is particularly notable because this pattern is opposite to one that has been repeatedly found between conflict inhibitory control and theory of mind skills, like false belief, in which early conflict inhibitory control predicts later theory of mind but not vice versa (e.g., Hughes & Ensor, 2007). This was unexpected considering that pretense is generally thought to be a precursor to theory of mind and the two are theorized to share similar cognitive demands (Lillard, 1993). However, the fact that delay inhibitory control did not predict later pretense is consistent with research on theory of mind, which shows that delay inhibitory control does not contribute to theory of mind performance beyond the contribution of conflict inhibitory control.

The present research suggests the relationship between conflict inhibitory control and pretense is unique compared to other similar representational abilities. Mapping the relationships among self-control, pretense, and theory of mind is another area ripe for future research. One hypothesis in need of empirical testing is that self-control moderates the relationship between pretense and theory of mind. It may be that pretense helps children develop self-control, which in turn allows children to develop an understanding of mental states.

Conclusions

There are a number of limitations present in this research. For one, the small sample size at both time points, but especially at Time 2, means that there was not enough power for more sophisticated data analyses, which could have clarified the relationships found among the many variables assessed. Secondly, no measure of verbal ability or intelligence was obtained. Given that this sample was made up of children of highly educated parents, it is reasonable to hypothesize the participants had above-average vocabulary sizes and

intelligence for their age. Both inhibitory control (Blair & Razza, 2007) and pretense (e.g., Taylor & Carlson, 1997) have been previously found to be positively correlated with intelligence. Thus, it may be that the relationships observed could be entirely or partially explained by these other variables. It could also be that, due to the limited diversity of the sample, the relationships revealed in the present study would not generalize to a broader population of children from less educated families.

However, the original goal of this research was simply to explore a question, whether certain aspects of temperament are associated with young preschoolers' developing pretense abilities, which had not been previously studied. This study was designed to test the waters, so to speak. Pretend play has long been noted as a key cognitive and social skill; it is both a signal of children's developing symbolic understanding and provides them with an additional opportunity to interact with family members and peers. These interactions, in turn, allow children to learn about people and relationships, fostering their development of a theory of mind. Thus, knowing how pretending develops and how it may influence children's other traits and abilities adds significantly to our understanding of early development. Despite its limitations, it did accomplish this goal by revealing two interesting and revealing relationships between early temperament and children's pretense ability. First, early negative affect may facilitate higher quality pretense. Second, pretense is not only consistently related to the self-regulatory abilities of conflict inhibitory and effortful control, it may contribute to their development. Overall, these patterns suggest that pretense is both affected by and can affect young children's temperament. They also reveal several open questions for future research to pursue, including exploring why these relationships exist and how they could be used, perhaps by parents or teachers, to children's benefit.

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REFERENCES

- Astington JW, Jenkins JM. Theory of mind development and social understanding. *Cognition and Emotion*. 1995; 9(2-3):151-165.
- Blair C, Razza RP. Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*. 2007; 78(2):647-663. [PubMed: 17381795]
- Cameron CE, McClelland MM, Jewkes AM, Connor CM, Farris CL, Morrison FJ. Touch your toes! Developing a direct measure of behavioral regulation in early childhood. *Early Childhood Research Quarterly*. 2008; 23:141-158.
- Carlson SM. Developmentally sensitive measures of executive function in preschool children. *Developmental Neuropsychology*. 2005; 28:595-616. [PubMed: 16144429]
- Carlson SM, Mandell DJ, Williams L. Executive function and theory of mind: Stability and prediction from ages 2 to 3. *Developmental Psychology*. 2004; 40(6):1105-1122. [PubMed: 15535760]

- Carlson SM, Moses LJ. Individual differences in inhibitory control and children's theory of mind. *Child Development*. 2001; 72:1032–1053. [PubMed: 11480933]
- Carlson SM, Moses LJ, Claxton LJ. Individual differences in executive functioning and theory of mind: An investigation of inhibitory control and planning ability. *Journal of Experimental Child Psychology*. 2004; 87:299–319. [PubMed: 15050456]
- Diamond A, Barnett WS, Thomas J, Munro S. Preschool program improves cognitive control. *Science*. 2007; 318:1387–1388. [PubMed: 18048670]
- Dunn J, Cutting AL. Understanding others, and individual differences in friendship interactions in young children. *Social Development*. 1999; 8(2):201–219.
- Elder JL, Pederson DR. Preschool children's use of objects in symbolic play. *Child Development*. 1978; 49(2):500–504.
- Elias CL, Berk LE. Self-regulation in young children: Is there a role for sociodramatic play? *Early Childhood Research Quarterly*. 2002; 17:216–238.
- Farver JM, Wimbarti S. Paternal participation in toddlers' pretend play. *Social Development*. 1995; 4(1):17–31.
- Goldstein AB, Russ SW. Understanding children's literature and its relationship to fantasy ability and coping. *Imagination, Cognition and Personality*. 2000–2001; 20:105–126.
- Haight, WL.; Miller, PJ. *Pretending at home*. Albany, NY: State University of New York Press; 1993.
- Haight WL, Wang XL, Fung HHT, Williams K, Mintz J. Universal, developmental, and variable aspects of young children's play: A cross-cultural comparison of pretending at home. *Child Development*. 2003; 70(6):1477–1488. [PubMed: 10621968]
- Howes C, Matheson CC. Sequences in the development of competent play with peers: Social and social pretend play. *Developmental Psychology*. 1992; 28(5):961–974.
- Hughes C. Finding your marbles: Does preschoolers' strategic behavior predict later understanding of mind? *Developmental Psychology*. 1998; 34(6):1326–1139. [PubMed: 9823515]
- Hughes C, Dunn J. "Pretend you didn't know": Preschoolers' talk about mental states in pretend play. *Cognitive Development*. 1997; 12(4):381–403.
- Hughes C, Ensor R. Executive function and theory of mind: Predictive relations from ages 2 to 4. *Developmental Psychology*. 2007; 43(6):1447–1459. [PubMed: 18020823]
- Kochanska G, Murray KT, Jacques TY, Koenig AL, Vandegest KA. Inhibitory control in young children and its role in emerging internalization. *Child Development*. 1996; 67:490–507. [PubMed: 8625724]
- Leslie AM. Pretense and representation: The origins of "theory of mind". *Psychological Review*. 1987; 94:412–426.
- Lillard AS. Pretend play skills and the child's theory of mind. *Child Development*. 1993; 64:348–371. [PubMed: 8477622]
- McElwain NL, Cox MJ, Burchinal MR, Macfie J. Differentiating among insecure mother-infant attachment classifications: A focus on child-friend interaction and exploration during solitary play at 36 months. *Attachment & Human Development*. 2003; 5(2):136–164. [PubMed: 12791564]
- Meins E, Fernyhough C, Russell J. Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development*. 1998; 7(1):1–24.
- Mischel W, Shoda Y, Rodriguez ML. Delay of gratification in children. *Science*. 1989; 244:933–938. [PubMed: 2658056]
- Oh S, Lewis C. Korean preschoolers' advanced inhibitory control and its relation to other executive skills and mental state understanding. *Child Development*. 2008; 79(1):80–99. [PubMed: 18269510]
- Putnam SP, Rothbart MK. Development of short and very short forms of the children's behaviour questionnaire. *Journal of Personality Assessment*. 2006; 87:103–113.
- Rothbart MK, Ahadi SA, Hershey KL, Fisher P. Investigations of temperament at 3 to 7 years: The children's behaviour questionnaire. *Child Development*. 2001; 72:1394–1408. [PubMed: 11699677]
- Sharon T, Woolley JD. Do monsters dream? Young children's understanding of the fantasy/reality distinction. *British Journal of Developmental Psychology*. 2004; 22:293–310.

- Shiner RL, Buss KA, McClowry SG, Putnam SP, Saudino KJ, Zentner M. What is temperament *now*? Assessing progress in temperament research on the twenty-fifth anniversary of Goldsmith et al. (1987). *Child Development Perspectives*. 2012; 6(4):436–444.
- Slade A. Quality of attachment and early symbolic play. *Developmental Psychology*. 1987; 23:78–85.
- Taylor M, Carlson SM. The relation between individual differences in fantasy and theory of mind. *Child Development*. 1997; 68(3):436–455. [PubMed: 9249959]
- Uren N, Stagnitti K. Pretend play, social competence and involvement in children aged 5–7 years: The concurrent validity of the Child-Initiated Pretend Play Assessment. *Australian Occupational Therapy Journal*. 2009; 56(1):33–40. [PubMed: 20854487]
- Vygotsky, LS. *Mind in society: The development of higher psychological processes*. Cole, M.; John-Steiner, V.; Scribner, S.; Souberman, E., editors. Cambridge, MA: Harvard University Press; 1978.
- Wellman HM, Lane JD, LaBounty J, Olson SL. Observant, non-aggressive temperament predicts theory-of-mind development. *Developmental Science*. 2011; 14(2):319–326. [PubMed: 21499499]
- Werebe MG, Baudonnière P. Social pretend play among friends and familiar preschoolers. *International Journal of Behavioral Development*. 1991; 14(4):411–428.
- Youngblade LM, Dunn J. Individual differences in young children's pretend play with mother and sibling: Links to relationships and understanding of other people's feelings and beliefs. *Child Development*. 1995; 66(5):1472–1492. [PubMed: 7555225]

Table 1

Descriptive Statistics for Pretense, Inhibitory Control, Negative Affect, and Effortful Control for Time 1 and Time 2

Measure	Time 1		Time 2	
	Observed range	Mean (<i>SD</i>)	Observed range	Mean (<i>SD</i>)
Pretense	0.00–2.44	0.88 (0.67)	0.33–2.29	1.41 (0.63)
Conflict inhibitory control	0.00–1.92	0.48 (0.50)	0.00–2.00	0.96 (0.76)
Delay inhibitory control	0.00–2.00	0.90 (0.64)	0.00–2.00	1.32 (0.67)
Negative affect	3.05–5.26	4.13 (0.52)	2.19–5.55	3.98 (0.77)
Effortful control	4.06–6.60	5.19 (0.65)	3.78–6.39	5.36 (0.69)

Table 2
Bivariate Correlation Matrix for Measures of Pretense, Inhibitory Control, and Temperament for Time 1 and Time 2

	Time 1				Time 2				
	Delay IC	Conflict IC	Negative affect	Effortful control	Pretense	Delay IC	Conflict IC	Negative affect	Effortful control
Time 1									
Pretense	.20	.41**	.19	.36**	.33^	.27	.40*	.28	.41*
Delay IC		.16	.09	.12	-.06	-.04	.25	.02	.26
Conflict IC			.17	.34**	.28	.11	.64**	.44*	.36^
Negative affect				-.06	.47**	.41*	-.01	.43*	-.02
Effortful control					.10	.11	.48**	-.05	.87**
Time 2									
Pretense						.49**	.16	.33^	.33^
Delay IC							.47**	.29	.08
Conflict IC								.23	.30
Negative affect									
Effortful control									-.002

** indicates $p < .05$ (two-tailed);

* indicates $p < .05$ (one-tailed);

^ indicates $p < .10$ (one-tailed).