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A multidimensional investigation of pretend play and language competence: Concurrent and longitudinal relations in preschoolers



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ABSTRACT

Play is an important tool for children's social interactions and cognitive skills. The current study examines the links between pretend play and language in 119 Turkish preschoolers at two time points tested one-year apart (Time 1 M_{age} = 45.82 months and Time 2 M_{age} = 57.68 months). Preschoolers' language competence (linguistic complexity and receptive vocabulary) was assessed along with several pretend play measures (telephone task, imaginary pantomime task, pretense score from a free play session). Results showed that concurrently the telephone and imaginary pantomime task scores were associated with linguistic complexity at Time 1 and only the telephone score was related to linguistic complexity at Time 2. No concurrent associations were found between receptive vocabulary and pretend play measures. Furthermore, a longitudinal relation was found between language competence and one pretend play measure: Time 1 telephone score predicted Time 2 receptive vocabulary score. These findings are discussed in terms of the two domains potentially sharing the symbolic aspect as an underlying mechanism and social aspect through pretense creating contexts relevant to language development.

1. Introduction

Pretend play is a mode of play characterized by an “as-if” stance (Garvey, 1990) in which a pretender willingly and actively goes beyond simple nonliteral reality and layers “pretense” over reality (Austin, 1979; Lillard, 1993). An individual, who engages in pretend play knowingly projects a mentally represented alternative onto its present real environment. In this kind of play, players transform activities from their real objectives, and objects from their real counterparts (Fein, 1975). With the support of mental transformations, an object can be used to represent a different object, inanimate beings can be treated as if they are animate, and imaginary objects and/or characters can be constructed without any tangible referent in the present context of the pretender (Nielsen & Dissanayake, 2000). In some forms of pretend play, the person might even construct pretend events and/or situations, assign multiple perspectives to pretended beings, create dialogues, and act out imaginary stories with real or imagined characters (Leslie, 1987; Lillard, 1993). Children start simple pretend playing around 12 months of age (McCune-Nicolich & Fenson, 1984). Simple forms of pretend play such as object substitution may evolve into more complicated and elaborate role play as children age (Carlson, Taylor, & Levin, 1998; Danziger, 2006; Gaskins, 1999; Haight, Wang, Fung, Williams, & Mintz, 1999; Lillard, Pinkham, & Smith, 2010; Schwartzman, 1978; Taylor & Carlson, 2000). In childhood, engaging in pretend play activities is related to many skills such as executive functioning (e.g., Thibodeau, Gilpin, Brown, & Meyer, 2016; Vygotsky, 1978), social skills (e.g., Bretherton, 1989; Fein,

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1989; Fein & Kinney, 1994; Harris, 2000; Lillard et al., 2010), theory of mind (e.g., Leslie, 1987; Taylor & Carlson, 1997), and language (e.g., Bergen, 2002; Kirkham, Stewart, & Kidd, 2013; Lewis, Boucher, Lupton, & Watson, 2000; Piaget, 1945/1962; Sinclair, 1970; Werner & Kaplan, 1963). In this paper, we focus on pretend play's relation to language. In particular, we examine whether engaging in pretend play is related to children's language skills, concurrently and/or longitudinally.

The relation between pretend play and language has long been discussed and several factors have come to the forefront in support of it. From a Piagetian perspective, the two are argued to share a semiotic function, as pretending is asserted to be an early expression of children's ability to manipulate and understand symbols, and language is also a product of symbol construction and manipulation (e.g., Piaget, 1945/1962; Sinclair, 1970; Werner & Kaplan, 1963). In other words, play and language development are argued to be the reflections of a common underlying representational system as their developments reflect children's ability to use and understand symbols. Since a symbol can be defined as a deliberate representation of something other than itself (DeLoache, 2004), both language and pretend play can be argued to share a symbolic characteristic. Several theorists have further claimed that a causal link exists between the two as the repetitive use of symbols in pretend play "contributes greatly to language development" (Miller & Almon, 2009, p. 63; see also Ervin-Tripp, 1991). Thus, this approach entails that the observed relation between pretend play and language might be epiphenomenal as an outcome of the development of general symbolic capacity (Quinn, Donnelly, & Kidd, 2018).

Other than pretend play and language's shared symbolic characteristics, they also have common social aspects. Vygotsky (1962) positions play, yet not specifically pretend play, as an important factor of development that fosters several cognitive skills in children. Children enter enriched contexts during play that may strengthen their language abilities (Vygotsky, 1962). It may be possible to make the same argument specifically for pretend play, since children may benefit from language contexts related to their pretend play, both during and outside of their pretense episodes. Pretend play constructs a special context to favor the development of language (Vieillevoye & Nader-Grosbois, 2008). Bergen (2002) states that the language use and social interactions in pretend play lead researchers to include language in pretense research. The context of pretense can facilitate positive adult-child interactions in addition to interactions with peers (Paley, 2005; Smith, Dalgleish, & Herzmark, 1981), and during these interactions, children may be scaffolded by more competent play partners (Lillard et al., 2010). In addition to input from others, children also talk about their play during and outside of play episodes or share their pretense with others who are not part of their pretend activities. These pretense episodes can further propel their language abilities. According to Gleason (2004), pretense involves practice for how to interact with others, leading children who frequently engage in pretend play to be particularly adept at forming and maintaining relationships compared to children who engage in pretense less frequently. The same reasoning can be formed regarding language rehearsal during pretense episodes and perhaps even outside the play. The social characteristics of pretend play may also arise from pretend characters, such as a personified teddy bear or an invisible friend. The dialogue between the player and the pretend character can also be considered to foster language abilities of children. Therefore, all these social aspects of pretend play can facilitate the language competence of children who engage in pretense.

Several studies revealed concurrent associations between pretense and language development (e.g., Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Casby & Corte, 1987; Doswell, Lewis, Sylva, & Boucher, 1994; Jurkovic, 1978; Lewis et al., 2000; Lowe & Costello, 1976; Lyytinen, Poikkeus, & Laakso, 1997; Rosenblatt, 1977; Shore, 1986). These studies examine different language skills (e.g., vocabulary size, syntax) mostly with standardized language tests and different types of pretense assessing different aspects of it, including object substitution and play sequences (Lillard, Lerner et al., 2013). For example, Lewis et al. (2000) tested children between the ages of 1 and 6 years, using the Test of Pretend Play (ToPP; Lewis & Boucher, 1997), and the expressive and receptive language tests of Preschool Language Scale (PLS-3 UK; Zimmerman, Steiner, Pond, Boucher, & Lewis, 1997). They found that after controlling for chronological age, children's pretend play skills and language skills were correlated. Furthermore, Lyytinen et al. (1997) examined the link between language and play in a large group of 18-month-old infants through the assessment of pretense with the Symbolic Play Test (Lowe & Costello, 1976), and language with the parental report of MacArthur Communicative Development Inventory (Fenson et al., 1993) and the Reynell Developmental Language Scales (Reynell & Huntley, 1987). Concurrent associations were demonstrated between both language production (i.e., vocabulary size, the use of suffixes, utterance length) and language comprehension, and pretend play from a young age on.

Although the parallel relation between pretend play and language has been widely investigated, studies that examine longitudinal links between the two are far sparser. Several studies reveal relations between the development of language and pretend play at a young age varying from 7 months until the near end of the second year (Ogura, 1991; Veneziano, 1981). However, these studies do not examine predictive relations and have small sample sizes ($N = 4$ and $N = 6$ respectively). In a more recent study, Kirkham et al. (2013) investigated the predictive links with children between 3.5 (Time 1) and 4.5 years of age (Time 2) using one pretend play measure (ToPP) and two language measures at both time points. They found that earlier receptive language scores on a standardized test, but not the Mean Length of Utterances obtained from the transcripts of the mother/child play sessions, predicted later complexity of pretend play. In contrast, the pretend play scores at 3.5 years did not predict any language scores when children were 4.5.

Even though these studies present some connections between pretend play and language skills, the current study aims to fill a gap in the literature through three different aspects. First, Lillard, Lerner et al. (2013) emphasize common methodological problems in pretend play research. By using a larger sample size with a longitudinal design, this study attempts to overcome some of these methodological issues of the previous research. The longitudinal design is a strength to examine the developmental trajectories of both language competence and pretend play, and to investigate any possible predictive relations between these at two time points.

Second, previous studies that investigated language and pretend play relation mostly used vocabulary size or mean length of utterance as a language assessment. Although these measures shed light on the language competence of children to a considerable extent, language is a complex skill that cannot be operationalized solely through overall vocabulary knowledge or the number of utterances a child produces during an activity. Language involves a message to be conveyed, a logical flow to be followed, and

descriptions to evoke a message for third parties (Bruner, 1990; Nelson, 1996). Hence, to get a finer-grained and comprehensive language production measure, linguistic complexity (i.e., the use of complex and simple clauses in a narrative) is included in this study in addition to a standardized vocabulary measure.

Third, most studies used only one pretend play measure when examining the association between pretend play and cognitive skills including language. This becomes particularly a problem when different groups try to replicate earlier findings with small sample sizes (see Lillard, Lerner et al., 2013 for a review). Using multiple pretend play measures provides an opportunity to consider which aspects of pretend play explain variance in children's language skills, and to what extent certain pretend play measures and language measures are related (Lillard, Hopkins et al., 2013). Furthermore, examining different pretend play measures might also address criticisms on the lack of flexibility and intrinsic motivation in some pretend play tasks used in the literature (Bergen, 2013).

In this study, we use three pretend play measures (i.e., telephone task, imaginary pantomime task, pretense score from a free play session) that tap into social and/or symbolic aspects of pretend play (e.g., Bergen, 2002; Gleason, 2004; Piaget, 1945/1962). The telephone task comprises both the symbolic and the social aspects of pretend play. When children play with a toy telephone, they substitute the toy for a real telephone that corresponds to object substitution with similar form and function. Children also imagine that they converse with their best friend via the toy telephone. There is no real play partner during the telephone activity, but children can pretend to interact with a (pretend) persona, adding this kind of play a social aspect to an extent. Contrary to the telephone task, the imaginary pantomime task lacks any social characteristics as it involves children pretending to do certain actions (e.g., brushing teeth) either via imagining an invisible object and interacting with it or substituting a body part for an object. Thus, the imaginary pantomime task involves symbolic characteristics through object substitution without any social aspect. In addition to these two tasks, during free play sessions children could engage in object substitution and/or social pretend play as they have the opportunity to personify stuffed animals or substitute the toys for other objects during their pretend play (Harris, 2000). In free play session, children start pretending without any instructions or adult-directed initiative about how to play, and continue their play with flexibility with a wide range of available toys. Hence, using three different measures for pretend play skills of children allows us to assess which aspects of pretend play (i.e., social and/or symbolic) is related to language production and/or vocabulary comprehension.

This longitudinal study investigates how children's engagement in several pretend play activities are concurrently and longitudinally associated with language skills at preschool ages. We tested children at two time points: Time 1 (38- to 59-months) and Time 2 (50- to 71-months). We asked whether (1) language abilities and pretend play scores developed between Time 1 and Time 2, (2) there were concurrent links between different pretend play measures and language (a standardized vocabulary comprehension test score and linguistic complexity score from a narrative creativity task) both at Time 1 and Time 2, (3) pretend play scores at Time 1 predicted language abilities at Time 2, (4) language abilities at Time 1 predicted pretend play scores at Time 2. We hypothesized that children's language abilities and pretend play scores would increase from Time 1 to Time 2. Based on the previous findings, we expected that different pretend play abilities and both types of language measures would be positively related at both time points. We also hypothesized that pretend play scores at Time 1 would predict both the linguistic complexity score and receptive vocabulary at Time 2. We predicted that the linguistic complexity score and receptive vocabulary at Time 1 would predict pretend play scores at Time 2. Additionally, this study allowed us to examine whether certain aspects of pretend play (social or symbolic) were specifically related to language production and/or comprehension. We did not have a specific expectation about which aspect of pretend play would be more related with language competence as previous studies used only one of these pretend measures.

2. Method

2.1. Participants

The data of the current study were taken from a larger dataset exploring the socio-cognitive correlates of pretend play in Turkish children. The sample of the current study at Time 1 consisted of 119 Turkish-speaking children (58 girls) aged 38- to 59-months (*Age* = 46 months, *SD* = 6.01), and the sample at Time 2 consisted of 97 Turkish-speaking children (44 girls) aged 50- to 71-months (*Age* = 58 months, *SD* = 5.88). For Time 2, participants came to the session approximately one year after the first session (*M* = 12 months, 1 day, *SD* = 9 days, range = 10 months 29 days to 13 months 3 days). Although the age range was wide at each time point, for convenience in writing we will refer to children's age at Time 1 as 4-year-olds and Time 2 as 5-year-olds. Informed consent was obtained from all participants.

2.2. Measures

At both time points, participants engaged in the following tasks: the narrative creativity task, the telephone task, the imaginary pantomime task, a free play session, and a standardized receptive vocabulary task.

2.2.1. Narrative creativity task and linguistic complexity

The narrative creativity task was developed by Mottweiler and Taylor (2014) (adapted from the MacArthur Story Stem Battery; Emde et al., 2003). Originally the task intended to assess children's creativity; however, we investigated the linguistic complexity of narratives children produced during this creative process. In this task, the experimenters provided the beginning of a story until a designated point with the use of dolls and props, and then asked children to continue creating a narrative and finish the story. Children provided only a single completion without generating any alternative. In this task, the stimuli, prompts, and the designated

point where the experimenter stopped telling the narrative and asked children to continue were all controlled. Thus, the narrative creativity task was structured in the same way for all children. At Time 1, children received two narrative creativity tasks. They were first asked to complete a warm-up story stem (“The Birthday Party”), which could be understood and completed easily due to the familiarity of the script. Two dolls were used by the experimenter to act out the story. The dolls’ sex corresponded to the sex of children. After children completed the first story, the initial part of “The Magic Key” story stem was provided. Again, children were asked to complete the story. The second story allowed more space in terms of creativity, leading children to give more novel and out of script responses. The platform between the experimenter and participant was designed in a way that reflected the forest environment of the second story. The experimenter walked the dolls down the path to a small key. The experimenter then told to children “Ayşe/Selim and Selin/Murat are going for a walk outside when they see a key. Ayşe/Selim says, ‘What’s this on the ground?’ Selin/Murat says, ‘It’s a key. I wonder if it’s magic.’” Then the experimenter asked, “Can you show me and tell me what happens now?”. After this question, the experimenter never interrupted children, and only encouraged them to continue building a narrative if the child had no response. At Time 2, children were only asked to narrate the Magic Key story.

All narrative creativity task transcriptions were converted into a form following the conventions used by [Berman and Slobin \(1994\)](#), with one ‘verbed clause’ per line. A clause was defined as “any unit that contains a unified predicate ... expressing a single situation (activity, event, or state)” ([Berman & Slobin, 1994, p. 660](#)). The coding of children’s language during the narrative creativity task included total number of utterances, clauses, predicatives, simple clauses, complex clauses, and the percentage of complex clauses to total clauses. The utterances referred to all meaningful spoken words and the clauses referred to all sentences that have predicatives. Predicatives referred to the elements of the predicate of a clause that have the function of supplementing the subject or object by means of a verb. Simple clauses were coded as clauses with only one predicate. Complex clauses included adverbials and relative clauses that provided temporal-locative-causal information, conjunctions that combined two clauses in a meaningful manner, conditions that correspond to “if-then” statements and reported speeches. The definitions and examples of simple clauses and complex clauses can be found in [Table 1](#). As the last linguistic variable, the percentage of complex clauses with respect to the total number of clauses indicated linguistic complexity. The linguistic complexity score was coded by two independent coders. The first author coded the linguistic complexity of all participants while another trained research assistant coded the 20 % of the total participants both for Time 1 and Time 2. The interrater reliability was high for both time points, $r(24) = .99, p < .001$, and $r(24) = .96, p < .001$, respectively for Time 1 and Time 2.

2.2.2. Receptive vocabulary task

The Turkish Receptive Language Test (TIFALDI-R) ([Kazak Berument & Güven, 2010](#)) aims to assess 2- to 12-year-old children’s receptive vocabulary skills and includes 104 items. Each item consists of four pictures on a page, one of which represents the stimulus word presented by the experimenter. The child’s task was to respond by selecting the picture that best illustrates that word’s meaning. The total number of correct responses were summed as the score of the task. TIFALDI-R is a norm-referenced test with good psychometric qualities, though we used the raw scores since we were interested in individual differences. In terms of the reliability and validity of the task, all the coefficients were high as the test-retest reliability was .97, split-half reliability had a .99 Spearman-Brown value, and the internal consistency of all 104 items had a .99 Cronbach’s alpha ([Kazak Berument & Güven, 2013](#)).

2.2.3. Telephone task

In the telephone task, experimenters asked children to name and call their best friend using the toy telephone provided and pretend as if they were talking with their best friend on the phone ([Tahiroglu, Mannering, & Taylor, 2011](#)). For the telephone task, the participants were given a score ranging from 0 to 4. The score of 0 indicated that the child did not engage in the task and did not interact with the phone, the score of 1 indicated that the child physically interacted with the phone such as pushing the buttons on the phone and/or holding the receiver to their ear, the score of 2 indicated that the child talked on the phone, the score of 3 indicated that the child appeared to listen to the other person that s/he is talking to on the phone, and the score of 4 corresponded to the child’s generation of a conversation with a deeper content that exceeded stereotyped greetings including “hi” or “how are you?”. The task was coded by two independent coders and the interrater reliability was high for both time points, $r(105) = .89, p = .001$, and $r(92) = .93, p < .001$, respectively for Time 1 and Time 2.

2.2.4. Imaginary pantomime task

The research of [Overton and Jackson \(1973\)](#) indicates that the majority of 4-year-old children use their bodies to represent an imaginary object whereas by the age of 6, children tend to imagine an absent object and pretend to use it during an action sequence. In the current study, children were asked to pretend to engage in seven different action sequences. These actions were brushing teeth, combing hair, wearing glasses, writing with a pencil, drinking soup with a spoon, hammering a nail, and cutting with scissors. During these actions, children could either imagine an object and pretend to use this object (e.g., pretending to hold an invisible brush to pretend to comb hair with), or substitute a body part and pretend with it (e.g., using hand and fingers as if they were a comb).

For the Imaginary Pantomime task, the number of pretend actions in which children imagined an object and pretended with it rather than substituting a body part or parts were summed and its percentage was calculated with respect to the total number of pretend actions. This percentage score was named as the imaginary pantomime score. All the videotaped pretend actions were coded by two independent coders. Since nearly all the participants substituted their body parts during the actions of writing with a pencil, hammering a nail and cutting with scissors, these three actions were not included in the analyses. The remaining four pretend actions were coded for the imaginary pantomime score. The interrater reliability was high for both time points, $r(109) = .84, p < .001$ and $r(95) = .83, p < .001$, respectively for Time 1 and Time 2.

Table 1
Linguistic Complexity Coding.

Linguistic Complexity Components	Categories	Definitions	Turkish Examples	English Translations	
Simple clause	Complex clauses	Infinitival clauses	A clause with one predicate	<i>Kapıyı açalım.</i>	<i>Let's open the door</i>
		Coordinate clauses	A clause with two predicates joined by the <i>-ma/-mak</i> construction in Turkish	<i>Kapının içinden yürümeye başlıyordum.</i>	<i>They started walking through the door.</i>
Complex clauses	Subordination with adverbial and complement clauses	Subordination with adverbial and complement clauses	Two clauses joined with a coordinating conjunction such as 'and,' 'but,' 'then,' 'at last,' 'however,' 'because'	<i>Kapı kırılmış çünkü dinazorlar buraya gelmişler.</i>	<i>The door was broken because the dinosaurs came in here.</i>
			Two clauses joined by a subordinating conjunction such as <i>-an/-en</i> ('who')	<i>Bahçedeki bütün devrilmiş ağaçları dizilmiş</i>	<i>He adjusted all overturned trees in the garden.</i>
			<i>-miş/-miş (-ed)</i>		
			<i>-dığı zaman</i> ('when')		
Complex clauses	Subordination with converbs		<i>-sa/-se</i> ('if')		
			<i>-diği için</i> ('for that reason')		
			<i>-dikten sonra</i> ('after' 'while', 'so')		
			Two clauses joined as	<i>Sonra giderken kırmızı yaprak görmüşler</i>	<i>Then they saw a red leaf while walking.</i>
Complex clauses	Reported speech		<i>V + ken</i> (<i>koşarken</i>), ('while running')		
			<i>V + ince</i> (<i>koşunca</i>), ('when ran')		
			<i>V + ip</i> (<i>koşup</i>), ('running')		
			<i>V + erek</i> (<i>koşarak</i>), ('by means of running')		
			<i>V + a V + a</i> (<i>koşa koşa</i>) 'in the manner of running'		
			Two clauses in which a speaker's words reported in subordinate clauses governed by a reporting verb such as 'say', 'tell'	<i>"Aa burası neresi?" demişler</i>	<i>They said, "Oh where is this place?"</i>

2.2.5. Free play session

Affect in Play Scale was used to code the behaviors of children during free play (Russ, 1993). Children were given 5 min of free play along with a standard set of toys and instructions. They were asked to play and create a narrative while playing with the toys. Children were videotaped while playing. The 5-minute free play sessions were divided into sequences of 20 s and each sequence was coded for the type of dominant play; as pretend play (e.g., personifying stuffed animals), functional play (e.g., playing with a ball), or no play instances by two independent coders. Then the percentage of the time children engaged in pretend play, functional play or no play instances were calculated. The percentage of pretend play during play session was used as the pretense percentage score. As the interrater reliability was high for Time 1, $r(22) = .96, p < .001$, the same coders scored both Time 1 and Time 2.

2.3. Procedure

The procedure was the same for Time 1 and Time 2, except for the Narrative Creativity Task. At Time 1, the Narrative Creativity Task included both the Birthday Party and Magic Key stories whereas at Time 2 the task did not include the Birthday Party story as a warm-up, since all children already had an experience with the task from their previous session one year ago. Children were tested at a university laboratory at both time points. When children came to lab, they were first warmed up with the room and the experimenter. Although there were other tasks in between (as the data were part of a larger study), the order was first the receptive vocabulary task, then the pantomime task, the narrative creativity task, the free play session, and finally the telephone task. The entire session took approximately an hour. Children received a toy and a book as a gift at the end of each session, and a gift card was given to the families.

3. Results

3.1. Preliminary analyses

The descriptive data for all the language and pretend play measures of Time 1 and Time 2 can be found in Table 2.

Linguistic complexity, receptive vocabulary, and the pretend play variables were analyzed regarding gender differences. The independent samples *t*-tests revealed no significant differences between girls and boys regarding the language measures at Time 1 and Time 2. There was no gender difference for the Time 1 telephone score, but the Time 2 telephone score of girls was higher than that of boys (see Table 3). No difference between genders was found for the Time 1 performance on the imaginary pantomime task but the Time 2 imaginary pantomime score of girls was higher than that of boys. Last, the Time 1 pretense percentage of girls was higher than that of boys but there was not any gender difference for the Time 2 pretense percentage. The means, standard deviations, *t* values, *p* values, and Cohen's *d* values of these scores based on gender can be found in Table 3.

Before carrying out concurrent and longitudinal regressions, we examined bivariate correlations between all language measures (i.e., the number of utterances, the number of clauses, the number of predicatives, the number of simple clauses, the number of complex clauses, linguistic complexity, receptive vocabulary) and all pretend play measures (i.e., the telephone score, the imaginary pantomime score, and the pretense percentage score) both within the same time point and between the two time points (see Supplementary Materials Table 1).

3.2. Development of language and pretense

Paired samples *t*-tests were conducted to assess whether children's language abilities and pretend play scores increased from Time 1 to Time 2. The total number of utterances, clauses, complex clauses, linguistic complexity, receptive vocabulary, imaginary pantomime score and pretense percentage score yielded significant differences between the two time points. Each of these scores increased from Time 1 to Time 2. However, the total number of predicatives, simple clauses and telephone score yielded nonsignificant differences. All *t* values, *p* values, and Cohen's *d* values of these analyses can be found in Table 2.

Table 2
Descriptive statistics of all language and pretense measures at Times 1 and 2.

	Time 1				Time 2				<i>t</i> -test value	<i>p</i> value	Cohen's <i>d</i>
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.			
Utterances	30.90	22.96	2	116	42.80	32.09	8	160	$t(84) = -3.38$	.001	.45
Clauses	11.20	7.43	1	37	14.43	10.90	3	64	$t(84) = -2.52$	.014	.35
Predicatives	1.03	1.42	0	7	1.28	1.76	0	8	$t(84) = -.99$	.327	.15
Simple Clauses	8.20	4.87	1	33	9.48	8.01	0	54	$t(84) = -1.51$	.135	.22
Complex Clauses	2.67	4.08	0	24	4.72	5.06	0	28	$t(84) = -3.41$	.001	.41
Linguistic Complexity	.18	.21	0	.67	.31	.25	0	1	$t(84) = -3.67$	< .001	.47
Receptive Vocabulary	53.78	18.37	10	94	72.23	16.16	21	100	$t(91) = -11.18$	< .001	1.04
Telephone Score	2.47	1.28	0	4	2.70	1.23	1	4	$t(89) = -1.61$	.11	.21
Imaginary Pantomime	.34	.35	0	1	.47	.36	0	1	$t(90) = -3.01$	.003	.34
Pretense Percentage	48.31	31.62	0	100	78.59	23.52	0	100	$t(70) = -7.89$	< .001	1.06

Table 3
Gender differences regarding Time 1 and 2 linguistic complexity, receptive vocabulary, and pretense variables.

	Time 1					Time 2									
	Girls		Boys		t-test value	p value	Cohen's d	Girls		Boys		t-test value	p value	Cohen's d	
	Mean	SD	Mean	SD				Mean	SD	Mean	SD				
Linguistic Complexity	.20	.21	.17	.21	t(104) = .73	.465	.14	.33	.26	.29	.25	t(92) = .73	.47	.15	
Receptive Vocabulary Telephone Score	54.26	17.64	53.27	19.25	t(110) = 1.729	.28	.780	.05	69.55	18.96	74.45	13.19	t(75) = -1.45	.15	.30
Imaginary Pantomime Pretense Percentage	2.68	1.28	2.26	1.26	t(108) = 1.729	.087	.33	.36	3.11	1.17	2.36	1.18	t(95) = 3.158	.002	.64
	.40	.36	.27	.33	t(109) = 1.875	.063	.36	.36	.62	.32	.35	.34	t(95) = 4.083	< .001	.83
	56.29	28.66	39.46	32.69	t(95) = 2.703	.008	.55	.55	83.30	22.30	74.50	24.03	t(84) = 1.751	.084	.38

3.3. Predicting language from pretense concurrently

To examine the concurrent link from pretend play to language, age, and gender were included as control variables in the first step and all the three pretend play measures were included as predictors in the second step for both time points. Within the same time point the regression analyses were repeated for the two language measures (i.e., linguistic complexity and receptive vocabulary). The regression models in which pretense measures predicted the two language measures concurrently can be found in Table 4.

At Time 1, the model was significant for predicting linguistic complexity, $F(5, 79) = 3.137, p = .012$. Time 1 telephone score ($\beta = .226, p = .046$) and Time 1 imaginary pantomime score ($\beta = .247, p = .027$) were significant predictors whereas Time 1 age, gender, and Time 1 pretense percentage score did not predict Time 1 linguistic complexity. Overall, the predictors accounted for 16.6 % of the variance in Time 1 linguistic complexity.

Similarly, the model at Time 2 was significant for predicting linguistic complexity, $F(5, 78) = 2.906, p = .019$. Only Time 2 telephone score ($\beta = .363, p = .002$) was the significant predictor. Time 2 age, gender, Time 2 imaginary pantomime score, and Time 2 pretense percentage score did not predict Time 2 linguistic complexity. Overall, the predictors accounted for 15.7 % of the variance in Time 2 linguistic complexity.

Even though the models in which receptive vocabulary score was predicted by pretend play measures was significant at both Time 1 and Time 2, none of the pretense measures significantly predicted receptive vocabulary. At Time 1, the model was significant for predicting receptive vocabulary, $F(5, 76) = 9.313, p < .001$ and the only significant predictor was Time 1 age ($\beta = .541, p < .001$). Overall, the predictors accounted for 38 % of the variance in Time 1 receptive vocabulary. At Time 2, the model was again significant for predicting receptive vocabulary, $F(5, 80) = 7.078, p < .001$ and at this time only Time 2 age ($\beta = .447, p < .001$) and gender ($\beta = .298, p = .007$) were significant predictors. Overall, the predictors accounted for 30.7 % of the variance in Time 2 receptive vocabulary (see Table 4).

3.4. Predicting pretense from language concurrently

To examine the concurrent link from language to pretend play, age, and gender were included as control variables in the first step

Table 4
Concurrent Predictions from Pretense to Language.

Outcome: Language Scores																
Predictors	Linguistic Complexity								Receptive Vocabulary							
	Time 1				Time 2				Time 1				Time 2			
	SE(B)	β	p	R ²	SE(B)	β	p	R ²	SE(B)	β	p	R ²	SE(B)	β	p	R ²
Step 1																
Age	.004	.174	.113	.036	.005	.186	.092	.044	.266	.572	.001	.347	.262	.495	.001	.269
Gender	.046	-.079	.471		.056	-.082	.455		3.270	-.151	.102		3.148	.208	.030	
Step 2																
Age	.004	.118	.269	.166	.005	.163	.141	.157	.273	.541	.001	.380	.274	.447	.001	.307
Gender	.045	-.009	.934		.062	.045	.709		3.354	-.122	.196		3.609	.298	.007	
Telephone Score	.019	.226	.046		.024	.363	.002		1.355	-.133	.177		1.366	.150	.143	
Imaginary Pantomime	.065	.247	.027		.086	.086	.467		4.791	.136	.162		5.023	.087	.418	
Pretense Percentage	.001	-.007	.950		.001	-.091	.433		.059	.097	.339		.074	.074	.483	

Table 5
Concurrent Predictions from Language to Pretense.

Predictors	Telephone Score						Imaginary Pantomime						Pretense Percentage								
	Time 1			Time 2			Time 1			Time 2			Time 1			Time 2					
	SE(B)	β	p	R ²	SE(B)	β	p	R ²	SE(B)	β	p	R ²	SE(B)	β	p	R ²	SE(B)	β	p	R ²	
Step 1				.017				.112				.059				.179				.085	
Age	.022	.026	.798		.020	.110	.269		.006	.201	.047		.006	.175	.069		.516	.219	.039		.396
Gender	.265	-.127	.219		.241	-.313	.002		.070	-.140	.164		.068	-.379	.001		6.429	-.200	.059		4.779
Step 2				.134				.187					.113			.183				.100	
Age	.025	.066	.587		.022	.016	.880		.007	.098	.404		.007	.144	.187		.636	.142	.272		.463
Gender	.254	-.125	.207		.243	-.322	.002		.069	-.122	.218		.071	-.390	.001		6.495	-.187	.080		5.110
Receptive Vocabulary	.009	-.182	.139		.009	.120	.308		.002	.091	.444		.003	.059	.614		.219	.102	.431		.190
Linguistic Complexity	.613	.343	.001		.501	.224	.033		.168	.215	.038		.147	.025	.810		15.445	.083	.448		10.247

and linguistic complexity and receptive vocabulary were included as predictors in the second step for both time points. Within the same time point the regression analyses were repeated for three different pretend play outcomes (i.e., telephone score, imaginary pantomime score, pretense percentage score). The regression models in which language measures predicted the three pretend play measures concurrently can be found in Table 5.

At Time 1, the model for the telephone score was significant, $F(4, 91) = 3.529, p = .010$. Time 1 linguistic complexity score ($\beta = .343, p = .001$) was the significant predictor whereas Time 1 age, gender, and Time 1 receptive vocabulary score did not predict Time 1 telephone score. Overall the predictors accounted for 13.4 % of the variance in Time 1 telephone score. Similarly, the model was significant at Time 2, $F(4, 89) = 5.134, p = .001$. Time 2 linguistic complexity score ($\beta = .224, p = .033$) and gender ($\beta = -.322, p = .002$) (girls performing better) were significant predictors whereas Time 2 age and Time 2 receptive vocabulary score did not predict Time 2 telephone score. Overall, the predictors accounted for 18.7 % of the variance in Time 2 telephone score.

The model was also significant for predicting imaginary pantomime score at Time 1, $F(4, 93) = 2.957, p = .024$. Only Time 1 linguistic complexity score ($\beta = .215, p = .038$) was the significant predictor. Time 1 age, gender, and Time 1 receptive vocabulary did not predict Time 1 imaginary pantomime score. Overall the predictors accounted for 11.3 % of the variance in Time 1 imaginary pantomime. Although, the same model at Time 2 was significant, $F(4, 89) = 4.997, p = .001$, none of the language measures predicted Time 2 imaginary pantomime score; the only significant predictor was gender ($\beta = -.390, p = .001$). Overall, the predictors accounted for 18.3 % of the variance in Time 2 imaginary pantomime score.

The model for predicting free play pretense percentage score was not significant at Time 1. Even though the model for predicting pretense percentage score at Time 2 was significant, $F(4, 79) = 2.490, p = .050$, none of the language measures were significant. The only significant predictor was Time 2 age ($\beta = .244, p = .050$). Overall, the predictors accounted for 11.2 % of the variance in Time 2 pretense percentage score (see Table 5).

3.5. Predicting language from pretense longitudinally

To examine the longitudinal links from pretend play to language, Time 1 age, gender, and Time 1 equivalent of the outcome variable (i.e., when the outcome was Time 2 linguistic complexity, Time 1 equivalent of the outcome variable was Time 1 linguistic complexity and when the outcome was Time 2 receptive vocabulary, Time 1 equivalent of the outcome variable was Time 1 receptive vocabulary) were included as control variables in the first step, and all the three Time 1 pretend play variables were included as predictors in the second step. The analyses were repeated both for the linguistic complexity score and the receptive vocabulary score as outcome variables. The regression models in which pretend play measures predicted the language measures longitudinally can be found in Table 6.

The model for predicting Time 2 linguistic complexity score was significant, $F(6, 63) = 2.593, p = .026$. Time 1 linguistic complexity ($\beta = .331, p = .011$) was the only significant predictor. Time 1 age, gender, Time 1 telephone score, Time 1 imaginary pantomime score, and Time 1 pretense percentage score did not predict Time 2 linguistic complexity. Overall the predictors accounted for 19.8 % of the variance in Time 2 linguistic complexity.

In addition to Time 2 linguistic complexity, the model for Time 2 receptive vocabulary score was also significant, $F(6, 61) = 13.889, p < .001$. Time 1 telephone score ($\beta = .238, p = .011$), Time 1 receptive vocabulary ($\beta = .628, p < .001$), and gender ($\beta = .225, p = .011$) (boys performing better) were significant predictors whereas Time 1 age, Time 1 imaginary pantomime, and Time 1 pretense percentage score did not predict Time 2 receptive vocabulary. The predictors accounted for 57.7 % of the variance in Time 2 receptive vocabulary.

Table 6
Longitudinal Predictions from Pretense to Language.

Outcome: Time 2 Language Measures								
Predictors	Time 2 Linguistic Complexity				Time 2 Receptive Vocabulary			
	SE(β)	β	<i>p</i>	<i>R</i> ²	SE(β)	β	<i>p</i>	<i>R</i> ²
Step 1				.157				.479
Time 1 Age	.005	.054	.643		.309	.066	.575	
Time 1 Gender	.057	-.170	.137		2.854	.179	.054	
Time 1 Equivalent of the Outcome	.135	.332	.006		.101	.648	.001	
Step 2				.198				.577
Time 1 Age	.005	.038	.752		.287	.036	.744	
Time 1 Gender	.058	-.143	.227		2.696	.225	.011	
Time 1 Equivalent of the Outcome	.145	.331	.011		.095	.628	.001	
Time 1 Telephone Score	.025	.031	.806		1.140	.238	.011	
Time 1 Imaginary Pantomime	.086	-.092	.476		3.817	.020	.824	
Time 1 Pretense Percentage	.001	.204	.110		.048	.140	.142	

Note. When the outcome was Time 2 linguistic complexity, Time 1 equivalent of the outcome variable was Time 1 linguistic complexity and when the outcome was Time 2 receptive vocabulary, Time 1 equivalent of the outcome variable was Time 1 receptive vocabulary.

Table 7
Longitudinal Predictions from Language to Pretense.

Outcome: Time 2 Pretend Play Measures													
Predictors	Time 2 Telephone Score				Time 2 Imaginary Pantomime				Time 2 Pretense Percentage				
	SE(β)	β	<i>p</i>	<i>R</i> ²	SE(β)	β	<i>p</i>	<i>R</i> ²	SE(β)	β	<i>p</i>	<i>R</i> ²	
Step 1				0.116				.275					.185
Time 1 Age	.22	.055	.616		.006	-.002	.982		.454	.190	.122		
Time 1 Gender	.260	-.270	.016		.070	-.255	.012		5.569	-.093	.440		
Time 1 Equivalent of the Outcome	.107	.177	.111		.098	.414	.001		.092	.316	.013		
Step 2				0.132				.279					.187
Time 1 Age	.028	.103	.475		.008	-.039	.761		.658	.161	.363		
Time 1 Gender	.263	-.282	.013		.071	-.255	.013		5.673	-.091	.460		
Time 1 Equivalent of the Outcome	.113	.140	.232		.102	.400	.001		.096	.311	.018		
Time 1 Receptive Vocabulary	.009	-.125	.394		.002	.036	.780		.215	.053	.767		
Time 1 Linguistic Complexity	.678	.118	.340		.176	.059	.588		13.231	-.024	.853		

Note. When the outcome was Time 2 telephone score, Time 1 equivalent of the outcome variable was Time 1 telephone score, when the outcome was Time 2 imaginary pantomime score, Time 1 equivalent of the outcome variable was Time 1 imaginary pantomime score and when the outcome was Time 2 pretense percentage, Time 1 equivalent of the outcome variable was Time 1 pretense percentage.

3.6. Predicting pretense from language longitudinally

To examine the longitudinal link from language to pretend play, Time 1 age, gender, and Time 1 equivalent of the outcome variable (i.e., when the outcome was Time 2 telephone score, Time 1 equivalent of the outcome variable was Time 1 telephone score, when the outcome was Time 2 imaginary pantomime score, Time 1 equivalent of the outcome variable was Time 1 imaginary pantomime score and when the outcome was Time 2 pretense percentage, Time 1 equivalent of the outcome variable was Time 1 pretense percentage) were included as control variables in the first step, and Time 1 receptive vocabulary and linguistic complexity were included as predictors in the second step. Each pretend play measure was considered as outcome variables separately.

Even when the models were significant, none of the language measures significantly predicted Time 2 pretend play measures (neither linguistic complexity nor receptive vocabulary; see Table 7). The model for predicting Time 2 telephone score was not significant. The model for predicting Time 2 imaginary pantomime score was significant, $F(5, 74) = 5.727, p < .001$. Gender ($\beta = -.255, p = .013$) and Time 1 imaginary pantomime score ($\beta = .400, p < .001$) were significant predictors. Overall, the predictors accounted for 27.9 % of the variance in Time 2 imaginary pantomime score. The model for predicting Time 2 pretense percentage score was also significant, $F(5, 57) = 2.622, p = .033$. The only significant predictor was Time 1 pretense percentage score ($\beta = .311, p = .018$). Overall, the predictors accounted for 18.7 % of the variance in Time 2 pretense percentage score.

We further split the data with respect to gender and examined longitudinal regressions accordingly as the abovementioned patterns might be different for girls and boys (Lange-Küttner, 2017). Our longitudinal regression analyses revealed similar results for girls and boys (see Supplementary Materials Tables 2–6 for the details of these analyses).

4. Discussion

Pretend play is an important aspect of children's cognitive and social development. Many studies have investigated the relation between pretense and language through standardized language tests and with a single pretend play measure (e.g., Lewis et al., 2000; Lyytinen et al., 1997). The current study examined this relation at two time points during the preschool period, measuring pretend play with three different tasks and language competence via linguistic complexity in a narrative creativity task as well as via a standardized vocabulary comprehension score. First, we hypothesized that (1) language abilities and pretend play scores would develop from Time 1 to Time 2 and found support for it as all language and pretense scores, except for the telephone score, increased between the two time points. We also predicted that (2) pretend play scores would be related to linguistic complexity and receptive vocabulary at both time points. The results showed that two of the pretense scores (telephone and imaginary pantomime scores) were linked with linguistic complexity at Time 1 and only the telephone score was related to linguistic complexity at Time 2. However, in contrast to our hypothesis, none of the pretend play measures were associated with overall receptive vocabulary at either time point. Further, it was hypothesized that (3) pretend play scores at Time 1 would predict both the linguistic complexity score and receptive vocabulary at Time 2. In support of this hypothesis, we found that Time 1 telephone score predicted Time 2 receptive vocabulary score. Last, we expected that (4) both the linguistic complexity score and receptive vocabulary at Time 1 would predict pretend play scores at Time 2. However, we could not find support for the prediction that earlier language skills predicted later pretense skills. Overall, these findings demonstrated that language competence and pretend play skills of children developed as they age, were related concurrently, and earlier pretense predicted later receptive vocabulary.

4.1. Developmental trajectories of pretend play and language

The developmental trajectory of the language and pretend play measures was in line with our hypothesis. We found that all language and pretense scores, except for the telephone score, increased between the two time points. One might argue that the stability in the telephone score might be due to the ceiling effect at both time points. However, there was no ceiling effect and a pattern of increase was observable in the telephone score as well (see Table 2). Another finding of the current study is how age and gender selectively had relations with pretend play and language measures. A thorough examination of the regression analyses demonstrated that age was a significant predictor for only some of the language and pretend play measures, and it generally became nonsignificant when predictors of interest (i.e., language or pretend play measures) were included in the models. Between the two time points all language and pretend play measures developed, except for the telephone score. However, there might be other socio-cognitive factors, such as theory of mind, beyond age that resulted in selective prediction of age in these analyses.

Moreover, group comparisons revealed no gender differences in any language measures at either time point whereas the pretense percentage score of girls at Time 1 was higher than that of boys and the telephone and imaginary pantomime scores of girls at Time 2 were higher than that of boys. When language and pretense connections were analyzed with regressions, gender had a role only when receptive vocabulary, telephone, and imaginary pantomime scores of 5-year-olds were the outcome variables. In particular, 5-year-old girls performed better when we analyzed the factors related to their performance for telephone and imaginary pantomime tasks. In contrast, 5-year-old boys performed better when we examined the factors related to the receptive vocabulary score. We found only a few differences related to gender at Time 2 when we compared boys and girls for each task. Girls seem to outperform boys in two of the three pretense measures, which would appear in the concurrent Time 2 regression models. It is, however, difficult to pinpoint the exact link between gender and our outcome variables in the regression models. An earlier review study reports that findings on participation in pretense by preschoolers have been inconsistent as some studies show girls participate more while others found no gender differences or results in favor of boys (see Göncü, Patt, & Kouba, 2002 for a review). These studies were conducted in laboratory settings or data were collected through naturalistic observations in children's classrooms. It was argued that different methods, types of pretend play or characteristics of play contexts might be the reasons for the equivocal results. Further, the specific age and different sample sizes may also lead to such findings. Although we did not have a specific hypothesis for gender, future research should have detailed analyses considering different pretense types and also different language skills such as vocabulary and linguistic complexity to understand whether gender is associated with either of these variables.

In sum, children's different pretend play and language skills develop during preschool age period, and children's age and gender were selectively connected with both pretend play and language skills.

4.2. Concurrent links between pretend play and language

Concurrent regression analyses yielded that children's certain pretend play skills and their linguistic complexity were related to each other bidirectionally over and above their age within the same time point. At Time 1, children's telephone score and linguistic complexity as well as the imaginary pantomime score and linguistic complexity were related bidirectionally. At Time 2, only the telephone score and linguistic complexity were related. In contrast to these pretend play measures, the pretense percentage score from the free play session and linguistic complexity did not predict each other at either time point. There were concurrent relations between pretense measures and linguistic complexity. Children's pretend play skills and their receptive vocabulary did not predict each other at either Time 1 or Time 2. Since not all our pretense measures were related to linguistic complexity at both time points, we argue that there is a selective link between pretend play and linguistic complexity. Although we expected concurrent associations between receptive vocabulary and pretend play measures, our study failed to find these relations at Time 1 and Time 2.

Pretending is argued to be an early expression of children's ability to manipulate and understand symbols (Piaget, 1945/1962). Both the telephone and the imaginary pantomime tasks require children to construct and manipulate symbols. In the telephone task, children play with a toy phone as if it is a real one while in the imaginary pantomime task children either imagine their body parts as different objects or imagine invisible objects and use them in their pretend actions. Thus, the concurrent associations between linguistic complexity and these two pretend play measures are in line with the account of pretense and language having a connection through a symbolic domain. According to the classical Piagetian account, pretend play and language are symbolic domains that develop in parallel due to the development of a single domain-general symbolic capacity (Bornstein, Haynes, O'Reilly, & Painter, 1996). The parallel development can be supported with temporal correspondences such as the emergence of presymbolic behaviors at similar times in both domains (McCune-Nicolich, 1981). Similarly, longitudinal studies of Ogura (1991) and Veneziano (1981) revealed temporal relations between symbolic play and early language development. However, according to Quinn et al. (2018), any concurrent relation found after the age of 3 can be in contrast with the Piagetian account as the period of transition to symbolic functioning is limited to 9–36 months in Piaget's view. Contradictory to Piaget's claim, Quinn et al. (2018) found concurrent relations between pretend play and language in children who are older than 3 years of age. Similarly, our study points to a significant connection between pretense and language at ages 4 and 5. It is possible that the transition period that Piaget mentions may not be limited to 9–36 months and continue beyond the attested age range. Hence, the symbolic characteristic of both language and pretend play is a factor for the two to have a concurrent link.

During pretense episodes (social or solitary) children create contexts favorable to their language abilities (Vieillevoye & Nader-Grosbois, 2008). In social play, children interact with other play partners - real or imaginary (Lillard et al., 2010; Paley, 2005; Smith et al., 1981). Children can play with their siblings, friends, and parents; yet, when there is no real partner in play, children may interact with pretend characters (e.g., object personification, imaginary companions). Furthermore, even outside their pretense

episodes children may talk about their pretense routines and characters with their parents, siblings or peers. All these interactions provide children opportunities to practice their language skills and to be exposed to others' language competence.

Several studies revealed that in the course of pretend play children talk more, utter longer words, and use more advanced language (e.g., future tense, interrogative clauses, conditional verbs, descriptive adjectives, mental state verbs) relative to other activities they are engaged in (Fekonja-Pekljaj, Umek, & Kranjc, 2005; Singer & Singer, 1981). Furthermore, this account is also parallel to the Vygotskian argument that children may strengthen their language abilities through enriched contexts of play (Vygotsky, 1962). Even though there is no interaction with a real play partner, the telephone task administered offers children an opportunity to engage in a pretend conversation with their friends on the phone. During the task some children do not engage in pretense, not talking at all, some children use scripts, such as "hello" or "how are you", and some children exhibit elaborate dialogues (with pauses and necessary turn taking episodes) such as a future vacation plan. An important point about the telephone task might be that most children can have a certain script for it. The task itself is one of the major mediums of communication. Most children did not have difficulty in performing the basics of the task (e.g., holding the receiver to their ear). Consequently, the individual differences observed in this task can be an important indicator of pretend capabilities. The connection between the telephone task and linguistic competence in our study at the two time points highlights that the social contexts pretend play creates can foster language skills. Likewise, children who have complex language skills can use them in a pretend play task that illustrates social aspects of pretend play.

Contrary to our hypothesis, the free play session in the current task did not have any relations with linguistic complexity or receptive vocabulary knowledge. This finding is surprising because children had the most flexibility in this measure and they could play without any direct instructions or adult directives as we only instructed children to play and create stories while playing. By the time children engaged in free play session, they were already accustomed to the lab context. The length of the free play session (5 min) seemed to be sufficient for children to engage in pretense episodes. However, as the protocol of the Affect in Play Scale (Russ, 1993) suggests, the coding in the free play session included three major categories as the dominant play for every 20 s: pretend play, functional play or no play. This coding could fall short to break down pretend play further and examine the richness and complexity or type of pretense. Children's pretend play in free play sessions could be separated into further types, such as object substitution, object personification and impersonation. The relations between these types of pretense and language competence could be investigated in future studies. Furthermore, this coding scheme provides us to code only observable actions and expressions of children, and we might not detect some levels of expressions as a result of individual differences among children (e.g., being shy).

The link found between the imaginary pantomime score and linguistic complexity at Time 1 was not observed at Time 2 whereas the link between the telephone score and linguistic complexity was found at Time 1 and maintained at Time 2. Such results suggest that when children were at around the age of 4, both social and symbolic characteristics of pretend play and language explained the variance in the relation of the two domains. However, when children were at around the age of 5, social aspects may become more dominant in explaining the relation relative to the symbolic aspect. As Lillard, Hopkins et al. (2013) argued, different types and characteristics of pretend play are related to different outcomes in children such as language in the case of the current study.

In short, both the symbolic and the social characteristics of pretend play and language could explain the connection of the two domains concurrently. As children develop from 4 to 5 years of age, the symbolic aspect accounts for the connection less whereas the social aspect remains as a consistent factor of the relation.

4.3. Longitudinal links between pretend play and language

Our study also investigated the longitudinal links among pretend play, linguistic complexity, and receptive vocabulary knowledge using different models. The longitudinal results demonstrated that children's telephone score at around age 4 predicted their receptive vocabulary knowledge at around age 5, yet none of the pretense measures at age 4 predicted linguistic complexity at age 5. Furthermore, children's linguistic complexity and receptive vocabulary knowledge at age 4 did not predict their pretend play scores at age 5. These longitudinal results suggest that earlier pretense may predict later receptive vocabulary; yet, the opposite longitudinal prediction of language scores predicting the pretend play scores does not hold.

The contexts pretense creates may foster language skills and may have a direct role on the improvement of language skills. Earlier pretense may predict later receptive vocabulary as children's pretense episodes sometimes take place in unusual contexts, such as an old castle inhabited by a dragon or a pirate ship in the middle of an ocean, and these contexts may expose children to novel vocabulary with words like "dragon", "mermaid", "rescue", "treasure" (Weisberg et al., 2015). Additionally, the longitudinal connection between the earlier telephone score and later receptive vocabulary knowledge might indicate that the social aspect of pretend play might foster children's language development. Considering the result that the social aspect of pretense consistently explaining the variance in linguistic complexity at both time points, the longitudinal result also points to the significance of the social characteristics of pretend play in children's language development.

Longitudinal analyses revealed that receptive vocabulary was predicted by pretend play, but linguistic complexity was not. One potential reason for the nonsignificant longitudinal linguistic complexity results can be other mediating variables between language and pretend play as the benefits of these variables may be present for receptive vocabulary but not for linguistic complexity. These mediating variables may include socioeconomic status (SES), parental education and sensitivity, and nonverbal IQ. Previous research revealed that SES related variables affect both pretense and vocabulary development (Fein & Stork, 1981; Hoff, 2003), yet longitudinal relations hold even after controlling for parental education levels (Lyytinen, Laakso, Poikkeus, & Rita, 1999; Lyytinen, Poikkeus, Laakso, Eklund, & Lyytinen, 2001). Furthermore, although pretend play and language at 14 months independently predicted general cognitive development at age 2 measured by Bayley Scales of Infant Development (Bayley, 1993), Kirkham et al.

(2013) revealed concurrent association between pretense and language in children aged 3 and 4 after controlling for non-verbal IQ.

One of our pretend play measures longitudinally predicted one of our language measures whereas the language measures at Time 1 did not relate to any of the pretend play measures at Time 2. One reason for this asymmetrical longitudinal relation could be that pretend play is influenced by additional factors that language does not consist of. Language and pretend play not only have links due to their shared characteristics such as being symbolic and creating joyful social contexts but may also have links solely due to features that are particular to pretend play. These features that are unique to pretense may also contribute to language development whereas language may not have particular characteristics of its own (i.e., not shared with pretend play) that contribute to pretense. However, this argument needs further investigation.

Our finding on the link between the telephone score and overall vocabulary comprehension seems to contradict the findings of Kirkham et al. (2013). They found the very opposite pattern of findings of our study: that pretense skills at age 4 did not relate to vocabulary knowledge at age 5, but vocabulary knowledge at age 4 predicted pretense skills at age 5. They suggest that this asymmetry may be due to language becoming the dominant symbolic system between the ages of 4 and 5 through structuring and guiding development in other symbolic domains after an initial domain-general symbolic capacity (Karmiloff-Smith, 1992). One possible difference for the contradictory results between the two studies could be due to the measures and/or analyses used. First, Kirkham and colleagues assessed pretend play skills with only one measure (i.e., ToPP) whereas we used three different pretend play measures. Thus, our pretend play measures can be more sensitive to detect a longitudinal relation between specific aspects of pretend play and vocabulary knowledge. Second, during their regression analyses Kirkham and colleagues did not control for the Time 1 correspondents of their Time 2 outcome variables. For instance, their regression analysis examining the influence of language, graphic symbolism, non-verbal measures and age at Time 1 upon symbolic play at Time 2 did not include symbolic play at Time 1 as a control variable. Hence, the results could be due to an overestimation with the absence of covariates.

Overall, our study provided a longitudinal link between pretense and language measures at preschool ages. There was a connection between children's earlier social pretend play and later receptive vocabulary knowledge. Future research can investigate the characteristics of pretend play in more detail for a deeper understanding of the underlying mechanisms that connect pretend play and language.

5. Conclusion

This study examined the concurrent and longitudinal associations between pretend play and language competence using multiple measures from both domains. Findings showed that all pretend play and language measures, except for the telephone score, increased during preschool age period. Furthermore, the results revealed temporal links at the ages of 4 and 5. The pretend play measures were selectively related to linguistic complexity, but there was no concurrent connection between the pretend play measures and receptive vocabulary knowledge. These findings suggest that both the social and symbolic characteristics of the two domains might play important roles on the relation between these domains. The social aspect explains the variance in the relation consistently at both time points whereas the symbolic aspect explains less variance as children get older. Last, children's earlier pretend play skills were selectively related to their later receptive vocabulary knowledge. The longitudinal findings stress the importance of social characteristics of pretend play on children's language development.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.cogdev.2020.100870>.

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