The acquisition of gender labels in infancy: Implications for sex-typed play

Kristina M. Zosuls,
New York University

Diane N. Ruble,
New York University

Catherine S. Tamis-LeMonda,
New York University

Patrick E. Shrout,
New York University

Marc H. Bornstein, and
National Institute of Child Health and Human Development

Faith K. Greulich
New York University

Abstract

Two aspects of children's early gender development - the spontaneous production of gender labels and sex-typed play - were examined longitudinally in a sample of 82 children. Survival analysis, a statistical technique well suited to questions involving developmental transitions, was used to investigate the timing of the onset of children's gender labeling as based on mothers' biweekly reports on their children's language from 9 through 21 months. Videotapes of children's play both alone and with mother at 17 and 21 months were independently analyzed for play with gender stereotyped and neutral toys. Finally, the relation between gender labeling and sex-typed play was examined. Children transitioned to using gender labels at approximately 19 months on average. Although girls and boys showed similar patterns in the development of gender labeling, girls began labeling significantly earlier than boys. Modest sex differences in play were present at 17 months and increased at 21 months. Gender labeling predicted increases in sex-typed play, suggesting that knowledge of gender categories might influence sex-typing before the age of 2.

Keywords

gender development; self-socialization; language development; play; sex differences

A growing body of research in social and developmental psychology demonstrates that the salience of social categories and, in particular, the verbal labeling of social groups, affect perceptions of social category distinctions. Category labels signal the importance of category-relevant information and influence inferences made about social group members (e.g., Bigler, 1995; Diesendruck & haLevi, 2006; Gelman & Heyman, 1999; Katz & Seavey, 1973). From a developmental perspective, it is important to examine children's understanding of gender as

a social category because it is typically the first collective social identity that children learn and is associated with a range of stereotypes used by children and adults to make inferences about others (Ruble et al., 2004). Even as early as preschool, children demonstrate knowledge of gender stereotypes (Martin, Ruble, & Szkrybalo, 2002), and use gender category information to make inferences about ambiguous behavior (Giles & Heyman, 2004). It is therefore important to ask: When do children first label gender categories? What are some consequences of this ability?

In addition to visual cues, such as physical appearance, verbal labels might be important cues for learning social categories at a very young age (Baron, Dunham, Banaji, & Carey, 2007; Gelman, Taylor, & Nguyen, 2004). For instance, when parents use gender labels when they point out the actions of other people (e.g., "See that boy running fast!") rather than gender neutral labels (e.g., "child"), they make gender category information salient. Thus, an examination of children's early learning of words to label social categories provides a useful window onto how and when social category awareness and identity emerge and how this knowledge relates to the preferences and behaviors of young children. The primary aims of the present study were twofold: (1) to describe the development of gender labeling before age 2 years and (2) investigate how this knowledge might relate to the development of gender stereotyped play.

Competing Theoretical Orientations

In this study, we focus on differences between social learning (Bussey & Bandura, 1999; Mischel, 1966) and self socialization (Maccoby & Jacklin, 1974; Menon, Tobin, Menon, Perle, & Perry, 2007) perspectives on the role of gender category knowledge in the emergence of sex-typed behaviors. Here, the term *self socialization* is used to represent three sets of theories that emphasize active construction in relation to social category identification: gender schema theories (e.g., Bem, 1981; Martin & Halverson, 1981), cognitive-developmental theories (Kohlberg, 1966; Ruble, 1994), and social categorization theories (Bigler, Jones, & Lobliner, 1997; Tajfel & Turner, 1986; see Liben & Bigler, 2002, and Ruble, Martin, & Berenbaum, 2006, for reviews of these different theoretical perspectives).

Both contemporary social learning (Bussey & Bandura, 1999) and self socialization (Martin et al., 2002) perspectives emphasize socialization relative to biological processes and highlight children's active attempts to match their behaviors to desired standards (Perry, White, & Perry, 1984). However, the two differ greatly in the significance attributed to early representations of gender categories (Perry et al., 1984). According to self socialization views, a milestone in gender development is children's understanding that there are two gender categories and that they themselves belong to one of these categories: an achievement termed *basic gender identity* or *self-labeling* (Martin, Ruble, & Szkrybalo, 2004). According to this perspective, basic gender identity motivates and directs the development of sex-typed behaviors.

In contrast, the contemporary version of social learning theory, Social Cognitive Theory, asserts that children develop sex-typed behaviors as the result of learning from social agents who model and reinforce those behaviors (Bussey & Bandura, 1999). Although this theory incorporates a number of cognitive skills as part of this social learning process, it does not consider basic gender identity to be an important contributor to the development of sex-typed behaviors. This idea that basic gender identity does not play a role in the emergence of gendered behaviors is, in part, based on evidence that sex-typed behaviors emerge before 2 years of age, presumably earlier than children understand or identify with gender categories (for a full discussion of this debate, see Bandura & Bussey, 2004, and Martin et al., 2002, 2004).

The existence of gender-typed behavior prior to gender identity need not refute the self socialization view, however (Martin et al., 2002, 2004). Even if some gender-typed behaviors

emerge very early, gender identity may play an important role in further organizing and promoting gendered behaviors. In addition, it remains possible that gender identity does, for the most part, precede the emergence of sex-typing. It is also possible that infants in previous studies documenting the emergence of gender identity might have possessed a basic understanding of gender categories before 2 years of age that existing research methods failed to capture. The present study sought to contribute to the literature on early gender development by providing a closer investigation of children's gender category knowledge before age 2 and relating this knowledge to early sex-differences in children's observed play behaviors.

Understanding Gender Labels

The attainment of gender identity requires that children understand that everyone, including themselves is either a male or a female (Kohlberg, 1966). Measures assessing gender identity have tested children's ability to understand and correctly use gender labels to specify themselves and others, an ability referred to as *gender labeling.* Gender labeling is thought to signal children's advance to a conscious awareness of separate gender categories and the ability to use gender category information deliberately (e.g., Fagot & Leinbach, 1993; Fagot, Leinbach, & O'Boyle, 1992)._Studies that have assessed the understanding of gender labels in very young children have typically used non-verbal measures that involve pointing to a picture of a male or female in response to an experimenter's question (e.g., Etaugh, Grinnell, & Etaugh, 1989; Fagot & Leinbach, 1989; Fagot, Leinbach, & Hagan, 1986) or sorting pictures (sometimes including pictures of the children themselves) into boxes designated for either males or females (e.g., Thompson, 1975; Weinraub et al., 1984). Most of these studies have concluded that children are generally not successful at using gender labels to non-verbally categorize themselves or others until they are about 28–30 months. Nevertheless, research using different procedures suggests that sorting tasks may not adequately gauge children's knowledge of gender categories. In one study, despite not being able to reliably sort photographs of others and themselves into male and female designated boxes, most 26 month olds were able to *verbally* label those pictures in response to the question "Who is this? What kind of person is this?" (Weinraub et al., 1984). In addition, a study using a preferential looking paradigm in which children were shown pairs of faces of men and women and boys and girls and were asked, "Where is the (lady/man or girl/boy)? Find the (lady/man or girl/boy)." found that 18-month-old girls could match adult gender labels and both girls and boys could match the label "boy"_(Poulin-Dubois, Serbin, & Derbyshire, 1998). These findings suggest that further study of gender labeling in young children is needed. Here we asked whether young children's gender-related vocabulary development would offer insight into children's level of gender knowledge.

Producing Gender Labels

The words children use are thought to be expressions of their mental representations, and advances in word learning and conceptual development are thought to be closely interconnected (Bloom, 1993). Once children learn words for categories, those words in turn support the acquisition of further information and inductive inferences about their referents (Nelson, 2005; Waxman & Lidz, 2006). Thus, children's knowledge of words for gender categories is an indicator of some conceptual knowledge of these categories and should instigate the elaboration of gender schemas. Because word production follows word comprehension, children's production of gender labels should be particularly good indicators of some conceptual knowledge of gender categories (Benedict, 1979). Nonetheless, few studies have looked at children's language production during the second year as a way to study the development of early gender category knowledge. Children begin to over-generalize the labels *mommy* and *daddy* to other females and males starting at about 18 months, suggesting an understanding of these social categories (Brooks-Gunn & Lewis, 1979). In one longitudinal

study of children's vocabulary, by 24 months, both boys and girls appeared to have produced more same-gender-typed words (e.g., dress, fire truck, girl, boy) than opposite-gender-typed words (Stennes, Burch, Sen, & Bauer, 2005). Although this study indicated the presence of early differences in vocabulary acquisition, it did not address children's knowledge of gender categories per se. In another study, 2-year-olds spontaneously used gendered language (including gendered nouns, pronouns, and proper names) over 90% of the time when referring to people depicted in picture books and were highly accurate, especially in reference to gender stereotype-consistent pictures (Gelman et al., 2004). These findings suggest that by 2 years, children have a certain degree of gender knowledge and some concept of gender stereotypes.

The spontaneous production of gender labels, namely *girl*, *boy*, wo*man*, *man*, *lady*, and *guy* should be a particularly good indicator of children's knowledge of gender categories. The first use of such words might also indicate not only gender knowledge, but the ability and motivation to actively parse the social environment into males and females. Furthermore, as this knowledge crystallizes, children are likely to gain an understanding of their own gender identities. The correct use of *girl* or *boy* in reference to oneself would strongly suggest knowledge of one's own gender. Thus in the present study, we used information about children's spontaneous and flexible production of gender labels in reference to others and self as a measure of gender category knowledge and basic gender identity.

Analysis of Emerging Behaviors

The first goal of our study was to investigate when in development children use gender labels systematically, whether the timing of the emergence of gender labels is related to different labeling milestones, and whether the timing and use of gender labels vary across boys and girls. In the present study, we used survival analysis (also referred to as event history analysis) to address these questions about the onset of gender labeling and timing differences between girls and boys (Hosmer & Lemeshow, 1999; Singer & Willett, 2003).

Girls have been shown to be more advanced in early language skills than boys (e.g., Bornstein & Haynes, 1998; Bornstein, Hahn, & Haynes, 2004; Fenson et al., 1994; Tamis-LeMonda, Bornstein, & Baumwell, 2001) and have been found to be more precocious than boys in their gender category knowledge (Poulin-Dubois, Serbin, & Derbyshire, 1998; Serbin, Poulin-Dubois, Colburne, Sen, & Eichstedt, 2001). If this is the case, they might be expected to use gender labels sooner, which in turn might have implications for the development of sex-typed attributes. Furthermore, if observed differences in the timing of gender labeling maintain after accounting for individual differences in general language skills, this would suggest the presence of other processes that lead girls to understand gender categories earlier than boys. Finally, regardless of whether gender differences in gender labeling can be explained by differences in overall language ability or other factors linked to gender, the implications for gender-based behaviors are clear. Because having a word for something in language feeds back into and solidifies conceptual categories (Nelson, 2005), then there might be evidence for earlier development of gendered behaviors in girls compared to boys. Some evidence does suggest such gender differences, as in the case of girls' earlier preference for same-sex playmates (e.g., LaFreniere, Strayer, & Gauthier, 1984). Language, in essence, not only presents evidence of a child having a particular schema or category, but also might function to further influence thoughts and behaviors.

Emergence of Sex-Typed Behaviors

The second goal of this investigation was to examine whether gender labeling might predict the emergence of sex-typed play. Much of the skepticism concerning the influence of basic gender identity and labeling on gender development is based on the assumption that gender-typed play emerges prior to labeling (Bandura & Bussey, 2004). Some studies have found

gender-typed play in children by approximately 2 years of age, with girls preferring to play with dolls and boys preferring to play with vehicles (e.g., Caldera, Huston, & O'Brien, 1989; Fein, Johnson, Kosson, Stork, & Wasserman, 1975; O'Brien & Huston, 1985). Few studies have looked at children's gender-typed behaviors and preferences *before* 2 years of age, and results have been mixed. For instance, while some studies have found early sex-typed preferences among girls but not boys (Katz & Kofkin, 1997; Roopnarine, 1986), others have found early sex-typed preferences mostly among boys (Cherney, Kelly-Vance, Glover, Ruane, & Ryalls, 2003; O'Brien & Huston, 1985; O'Brien, Huston, & Risley, 1983; Servin, Bohlin, & Berlin, 1999). It is difficult to draw conclusions from these studies because of different operationalizations of gender-typical play, differences in context (e.g., presence of peers or parents), small sample sizes within age groups, and the collapsing of different age groups (for a brief review, see Ruble et al., 2006). Other studies were conducted over two decades ago and lack sufficient detail about the stereotyped nature of the toys used and statistical results indicating the precise nature of the observed sex differences (e.g., Goldberg & Lewis, 1969).

One possible reason for inconsistent findings, aside from the noted differences in methods and procedures, is that the early sex differences might be very subtle and possibly restricted to the most highly stereotyped toys, such as dolls and trucks. If so, then analyses that collapse across groups of toys might mask gender differences that would otherwise be apparent if individual toys were considered. Therefore, in this study we examined children's preferences for individual toys (rather than stereotyped groups of toys) during sessions in which children played alone and then compared these results to when the same children played with their mothers. Furthermore, rather than collapsing findings across children of different ages, we examined play longitudinally at two specific ages before children turned 2 years old.

Present Study

The overarching goals of the present study were to provide a close investigation of the emergence of gender category knowledge and the relation between this knowledge and early gender differences in play. Specifically, we used biweekly diaries of children's language development, starting when infants first began to speak until they were approximately 21 months, to investigate the timing of the emergence of gender labeling. We were also interested in exploring whether gender differences exist in the onset and acquisition of gender labeling not accounted for by differences in vocabulary development more generally. Specifically, we expected girls to begin gender labeling before boys.

In addition to coding the language diaries, we observed children's play behavior at two time points, 17 and 21 months. We hypothesized that, along with the emergence of gender labeling, sex-typed play would develop between these ages. Based on prior research, we speculated that gender differences might only be observed for the most highly sex-typed toys, a doll and a truck, rather than toys such as a tea set, brush and comb set, and blocks. Critically, we hypothesized that the use of greater numbers of gender labels would be associated with greater *increases* in sex-typed play from 17 to 21 months. Knowing the labels for both own- and opposite-gender children (i.e., *girl* and *boy*) might have implications for children's sex-typed play because children who know both labels might be especially likely to learn which toys are stereotyped for children of each gender. Therefore, we also expected that children who had used both child gender labels would also be more likely to increase their sex-typed play during this time span compared to children who produced other combinations of labels or command only one or no gender labels. The presence of gender *self-labeling* was also of interest, as calling oneself a girl or a boy is a compelling indication of a basic gender identity. Thus, we hypothesized that compared to children who did not label themselves by 21 months, gender self-labelers would exhibit greater increases in sex-typed play.

Finally, all analyses investigating relations between gender labeling and sex-typed play were additionally conducted adjusting for the effects of two forms of representational abilities. To control for general language development, we covaried the age at which children achieved 50 words in their productive vocabularies. The accumulation of 50 words coincides with an acceleration in children's language production that has been referred to as the vocabulary "spurt" or "explosion" (e.g., Bates, Dale, & Thal, 1995; Bloom, 1973; Goldfield & Reznick, 1990; Nelson, 1973; Tamis-LeMonda, Cristofaro, Rodriguez, & Bornstein, 2006). Rapid gains in productive language at this time are associated with object categorization and the ability to use names to form completely new object categories (e.g., Booth & Waxman, 2002; Nazzi & Gopnik, 2001). Because the achievement of 50 words is associated with general categorization abilities that should be associated with understanding social categories, we expected this variable to be related to the development of gender labeling. Thus, gender labels were predicted to emerge around the same time as or slightly after, the achievement of this milestone. We anticipated that gender labeling itself would predict sex-typed play beyond this measure of general language ability.

The second control variable was children's symbolic play complexity at 17 months. The potential value of play as a window onto children's cognitive abilities has been recognized by researchers in children's language (Bloom, 1998; Tamis-LeMonda & Bornstein, 1994), theory of mind (Kavanaugh & Harris, 1999; Joseph, 1998; Lillard, 1998), social cognition (Flavell & Miller, 1998), and the social and cultural contexts of learning (Bornstein, Haynes, Pascual, Painter, & Galperin, 1999; Haight, Wang, Fung, Williams, & Mintz, 1999; Rogoff, 1998). By adjusting for both children's language and play abilities, we minimized the likelihood that general abilities linked to conceptual development explain an observed relation between gender labeling and sex-typed play.

Method

Participants

Altogether, 82 children (36 males, 46 females) and their mothers participated in this study. Participants were originally recruited from private obstetric and pediatric groups in a large metropolitan area as part of a larger study on children's language development. Only first-born, term infants who were free of any known neurological or sensory abnormalities participated. Participants were primarily European American. All participants came from middle-to upper-middle class ($M = 57.59$, $SD = 7.79$, on the Four Factor Index of Social Status, Hollingshead, 1975) intact English-speaking households. Eighty-five percent of the mothers ($M = 33.19$ years of age, $SD = 4.38$) and 79% of the fathers ($M = 35.89$ year of age, $SD = 5.56$) had completed at least 16 years of schooling. Language data for six participants (4 males, 2 females) were missing; therefore, the sample size for analyses involving language data was reduced to 76 children.

Coding and Analysis of Language Diary Data

Gender Labels—Diaries documenting the children's language development from 10 months ($M = 10.06$, $SD = .16$) to 21 months ($M = 21.51$, $SD = 1.15$) were coded for the presence of gender labeling. Mothers were provided with a packet of language inventories to use for note taking and to refer to during biweekly telephone interviews with a researcher. Based on these interviews of mothers' responses to extensive probing about their children's language comprehension and production, researchers were responsible for filling out the language inventories and creating language diaries each week. That is, a separate set of inventories was kept at the laboratory for each child; mothers' packets were only for reference and note taking. Packets included versions of the Early Language Inventory (Bates, Bretherton, & Snyder, 1988), MacArthur Communicative Development Inventories (Fenson et al., 1994), and

checklists exemplifying various semantic and syntactic uses of words and phrases (Tamis-LeMonda & Bornstein, 1994). The MacArthur-Bates Communicative Inventories have been found to have good concurrent and predictive validity, indicating that parents are reasonably good informants of their children's productive language development from ages 18 to 30 months (Bornstein & Haynes, 1998; Feldman et al., 2005). During the interviews, mothers were read a list of lexical items taken from a broad range of categories and probed about their children's expression of each item and about related items that were not on the inventories. Flexible production of words was defined as: (1) approximating the phonetic form of the word, (2) using the phonetic form in a consistent way that reflects an accurate application of the word's meaning, (3) spontaneous expression of the word without prompts or cues, and (4) using the word for more than one referent. Words that were used in reference to only one person or in restricted contexts in which contextual or other cues were necessary were not counted.

We were interested in two specific aspects of these diaries: flexible production of gender labels (i.e., *girl, boy, man, woman, lady*, and *guy*) and self-labeling (i.e., calling oneself *girl* or *boy*). The language diaries were coded for the dates at which the infants produced their first and subsequent gender labels and the presence or absence of each of the six gender labels. For each infant, variables were created to indicate the total number of gender labels that were flexibly produced by 17 and 21 months of age, such that each child had a value of between 0 and 6 for each of the two time points.

Of additional interest in the present study was when children were reported to have used gender self-labels. Researchers noted when parents explicitly mentioned that children used gender labels to refer to or describe themselves in their combinatorial speech (e.g., "I not your little baby. I your little girl."). A dichotomous variable, which indicated the presence or absence of gender self-labeling by 21 months, was created as an indicator of basic gender identity.

General language development—From the diaries, the age at which children accumulated a total of 50 flexible words in their expressive vocabularies was recorded and used as a covariate in each of the primary analyses. The age at which children spoke their first words was additionally recorded from the language diaries and used as a covariate in the event history analyses, as one might speculate that children who produce their first words earlier might also be more likely to produce any word, such as a gender label, earlier than other children. We predicted that the age of 50 words would be related to the emergence of gender labeling because learning gender categories should additionally require general categorization abilities, which have been associated with reaching the 50-word milestone.

Observations of Play

Children were visited in their homes when they were 17 months (*M* = 17.82, *SD* = .50, range = 16.30 to 18.70 months) and 21 months (*M* = 21.89, *SD* = .48, range = 20.67 to 23.03 months). At each time point, children were videotaped playing alone for approximately 10 min and playing with their mothers for an additional 10 minutes, both times with the same set of toys. To minimize mothers' influence on children's play during the play alone session, children were always videotaped playing alone first and mothers were instructed not to sit nearby or interact with their child. Toys were selected based on their familiarity in everyday life and their ability to lend themselves to pretense play.

Sex-typed play—This set included toys that according to past research (Blakemore & Centers, 2005; Campenni, 1999), are male stereotyped (truck), moderately male stereotyped (wooden blocks), female stereotyped (baby doll), moderately female stereotyped (neutral colored tea set, brush and comb set), and gender neutral (sponge, nesting cups, telephone, people that fit inside the truck). In accordance with past research (Servin, Bohlin, & Berlin,

1999; O'Brien & Huston, 1985; Weinraub et al., 1984), the tapes were coded for the total amount of time children spent in direct contact with each toy. If a child played with more than one toy at a time, separate times were recorded for each toy which the child contacted. For cases in which direct contact was intermittent because of the nature of play, as in certain types of play involving the doll (for example, "feeding" might entail moving the spoon from the bowl to the doll and back again) and the truck (for example, pushing and letting go of the truck), play time was recorded as long as the child's gaze was fixed on the toy and the child was engaged in an ongoing play activity involving the target toy. Four coders recorded play times using MacShapa, a Macintosh-based program created for the analysis of observational data. Thirteen percent of the tapes were independently coded by all four coders, and in accordance with the recommendations of Shrout and Fleiss (1979), intra-class correlation coefficients were calculated to establish reliability. Average reliability for the coders was .94 and range =.91 to .98 for the 6 possible combinations of pairs of coders.

Symbolic play—Level of symbolic play was used as a covariate in each of the primary regression analyses. Each child's alone play was separately coded for the presence or absence of 24 levels of increasing play sophistication (Damast, Tamis-LeMonda, & Bornstein, 1996; Tamis-LeMonda & Bornstein, 1996). The lowest play levels (levels 1 through 6) spanned different forms of exploratory play (e.g., touching object), functional play (e.g., pressing buttons on phone), and combinatorial play (e.g., stacking plates), and higher levels (levels 7 through 24) spanned increasingly difficult levels of symbolic play in which children engaged in vicarious play (e.g., pretend doll is talking), sequenced pretense (e.g., feeding doll and then putting doll to sleep), substitution pretense (e.g., pretending block is a car), and combinations of these forms (e.g., placing toy person on top of block and driving "car", and then person walks away from car). Children were credited a point for each level exhibited, with higher scores reflecting children's attainment of higher levels of symbolic play. The mean level of play complexity was 10.56 (SD = 3.76, range = 1 to 18) and there was no significant gender difference in this variable, t (80) = 1.32, p = .19.

Results

Descriptive statistics of the gender labeling data are presented first, followed by results of the survival analysis. Next, we present descriptive analyses of the play observations. Finally, regression analyses investigating the relation between gender labeling and sex-typed play. In the final section, we compare data from the mother-child and alone play sessions.

Gender Labeling

By 17 months, only 25% (16 girls, 3 boys) of the sample had produced a flexible gender label. By 21 months, 68% (35 girls, 17 boys) of the children had produced a flexible gender label. Consistent with the finding that girls achieve some language milestones earlier than boys (Fenson et al., 1994; Tamis-LeMonda, Bornstein, & Baumwell, 2001), girls were significantly more likely to have produced a gender label by 17 months, $\chi^2(1, N = 76) = 7.20, p = .007$, and 21 months, $\chi^2(1, N = 76) = 5.99, p = .014$. Furthermore, of the children who had produced a gender label by the time of the last interview, the first flexible production of a gender label (*girl, boy, man, woman, lady*, or *guy*) occurred, on average, a month earlier in girls ($M = 18.12$ months, $SD = 2.39$, range = 13.67 to 22.17 months) than in boys ($M = 19.39$ months, $SD = 1.76$, range = 16.10 to 21.83 months), t (50) = 1.94, p = .058.

Of the children who had produced gender labels by 21 months, 10% produced one label, 33% produced two labels, 27% produced three labels, 29% produced four labels, and 2% (1 child) produced five labels. It is not surprising that few children produced more than 4 gender labels, as children tended to use either, but not both, *woman* or *lady* (usually *lady*) to label adult females

and either, but not both, *man* or *guy* (usually *man*) to label adult males. Of the six labels, *girl* and *boy* were the most frequent labels at both ages. Of the 5 children who produced one label by 21 months, 2 produced the child label for their own gender (i.e., *girl* or *boy*) and the other 3 produced the label *man*. Approximately half of the children who produced 2 labels (47%) produced both *boy* and *girl*, 18% produced some other combination of labels for each gender, and 35% produced labels for only one gender (half of these children produced labels only for the opposite sex). A majority of children who produced 3 labels (71%) and 4 labels (87%) and the child who produced 5 labels produced both *boy* and *girl*. In other words, 68% of children who had produced 2 or more labels produced *girl* and *boy*. Overall, these data indicate that by 21 months, the majority of infants produced at least one gender label, and most children had produced multiple labels, including labels for children of both genders.

To further investigate whether there were any patterns to the first labels that children produced, we calculated the percentage of children who produced each of the six labels as a first label (see Table 1). Children who produced at least one gender label by 21 months also commonly produced a second label (42%) and some also produced a third label (10%) during the same 2-week period during which they produced their first label and it was not possible to decipher from the diaries which of the 2 to 3 labels these children produced first. Therefore, Table 1 reflects the 1 to 3 labels children produced in the 2-week period during which they began gender labeling. A McNemar test indicated that children were significantly more likely ($p = .005$) to produce child gender labels (i.e., *girl* and *boy*) compared to adult gender labels (i.e., *lady, man, woman, guy*). Binomial tests indicated that children were not significantly more likely ($p = .33$) to produce the label for a same sex child (i.e., boys produce *boy* and girls produce *girl*); however, they did reveal that children were more likely to produce a label for either an own sex adult or child, $p = .013$. A series of chi-square analyses revealed no gender differences in production of any of the 6 labels.

We also examined the relation between gender self-labeling and sex-typed play, as calling oneself *girl* or *boy* can be thought of as a much more compelling indicator of basic gender identity. A total of 13 children (3 boys, 10 girls), or 17% self-labeled by 21 months. All of the children who self-labeled produced 2 or more labels and all but 2 self-labelers produced both *boy* and *girl*, $r (76) = .44$, p < .001.

Survival Analysis of Onset of Gender Labeling

We were interested in describing the transition from never having uttered a gender label to uttering the first and subsequent gender labels. Although transition to the first label is presumably the most important achievement for our purposes because it represents the first shift in children's knowledge of gender categories, the addition of more gender labels to children's vocabularies certainly signifies the development of more complete and solidified knowledge of gender categories. We were also interested in investigating whether gender and the age at which children achieved two important milestones in language development (first word and 50 words) related to the timing of children's production of gender labels. We separately investigated the transition to the first and second gender labels, using child gender and general language development as covariates. Very few boys produced a third label and too few boys produced a fourth label to estimate a model; therefore, we focused our analyses on the first and second gender labels. Our time metric was age in weeks, beginning when children were 47 weeks and ending when children were 96 weeks. The age of 47 weeks was chosen as the "beginning of time", or starting point, in the analyses because this was the average age at which children produced their first words ($M = 47.12$, $SD = 5.41$, range = 41 to 68 weeks), thus representing an age at which no one in the sample had yet used a gender label, yet on average, participants were at least theoretically eligible to do so.

Inverse survivor functions—were used to illustrate the cumulative probability of children transitioning to using their first and second gender labels at each successive time period. We were also interested in the *median survival times* at which girls and boys transitioned to using their first and second labels. This statistic, which represents the point in time at which 50% of the sample has experienced the target event, is more useful than a mean because it takes account of "right-censored" cases, here children who had not yet produced a gender label by the last time point in data collection (32% of the sample). When calculating a mean, such cases are typically either excluded or assigned an arbitrary value past the time of the last observation._We used the Kaplan-Meier survival analysis in SPSS to model the inverse survival function and compare the survival functions of girls and boys. The Cox Regression procedure in SPSS was used to analyze the effects of gender and general productive language ability on the instantaneous probability of producing gender labels across all of the time points (for reviews of approaches to regression modeling of survival data, see Hosmer & Lemeshow, 1999, and Singer & Willett, 2003).

Survival analysis—An examination of the inverse survival function presented in Figure 1 indicates that for girls, the median survival time for the first gender label was approximately 36 weeks after the average age of first word production, or approximately 82 weeks of age (19 months) whereas the median survival time for boys was approximately 45 weeks after the average age of first word production, or approximately 92 weeks of age (21 months). The survival function presented in Figure 2 indicates that for girls, the median survival time to the second gender label was approximately 39 weeks after the average age of first word production or 3 weeks after the median survival time of the first label. For boys, the median survival time was approximately 47 weeks, approximately 2 weeks after the median survival to the first label. Thus, although median survival times for boys were consistently later than those for girls, both boys and girls were most likely to achieve their second labels at approximately equal time intervals (2–3 weeks) following achievement of the first gender label.

The sex differences observed in the inverse survival functions were further investigated for statistical significance using the Cox proportional hazards model. Table 2 presents parameter estimates for transitions to children's using the first and second gender labels. The first column lists the explanatory variables simultaneously entered into each model: gender and the two measures of general language development, age of 50-word productive vocabulary and age of first word. In the next two columns, the parameter estimate (an estimate of the natural logarithm of the instantaneous probability) and its standard error are listed for each variable. The EXP (Coeff) indicates that, at any given age in weeks, girls (coded as 1) are EXP(Coeff) more likely than boys (coded as 0) to produce a gender label. For both the first and second gender labels, girls were twice as likely to produce a new gender label as boys at the same age. This effect held with both measures of general language development as covariates. Given that achievement of 50 words in productive vocabulary is associated with categorization abilities, it is also interesting to note that the age of 50 words was the only index of general language ability that was significantly related to producing both the first and the second gender label. Children who achieved 50 words in their vocabularies later were less likely to achieve their first and second gender labels relative to children who achieved 50 words earlier. The mean age for the achievement of 50 words, 76.57 weeks (SD = 8.55, range = 58 to 92), was approximately 5 and 15 weeks before the median survival time to the first gender label for girls and boys, respectively. Children who spoke their first words later tended to be less likely to achieve their first gender labels at any given age in weeks compared to children who began to speak earlier, although this effect was not significant. The mean age for the first words was 47.12 weeks (SD = 5.41, range = 41 to 68), approximately 35 and 45 weeks before the median survival time to the first gender label for girls and boys, respectively. Surprisingly, there were no gender differences in the age of first word, $t(75)$ = .77, p = .44, nor in the age of 50 words,

t (75) = .55, p = .59. Thus, despite not having an advantage of boys in general language ability, girls appeared to learn gender categories earlier than boys.

Sex-Typed Play

The next set of analyses investigated whether sex differences were present in children's play at 17 and 21 months. Based on previous research, we expected the greatest degree of sex differences in play with the doll and the truck and we expected these differences to be greatest at 21 months, by which time most children have begun to develop gender category knowledge.

To adjust for any interindividual variation in the total length of the 10-min solitary play sessions at 17 (M = 10.16, SD = 1.17, range =4.96 to 13.74) and 21 months (M = 10.23, SD = .73, range = 6.96 to 13.17), play with each toy was calculated as a proportion of the total length of the play session. Specifically, for each participant total play time in seconds for each of the 9 toys at 17 and 21 months was divided by the total length of the respective session to create a proportion of time spent playing with each toy. We compared these proportions between gender groups using the version of t-test that does not assume equal variances. We also carried out an omnibus test of gender differences across the 9*2=18 variables using a logistic regression model in which gender was the outcome variable and the 18 proportions were the independent variables. If the list of 18 proportions can significantly predict gender, then we know there is a multivariate gender difference. This test makes no assumptions about the multivariate distribution of the 18 proportions and hence is preferred to a standard multivariate means test such as Hotelling's T^2.

Individual toy preferences—We compared boys and girls on all 18 proportions shown in Table 3, and found an overall significant gender difference using an omnibus test derived from a logistic regression model (Likelihood Chi Square (18) = 43.26, p = .001). Nonetheless, as illustrated in Table 3, at both ages, boys and girls were more similar than different in their play and exhibited substantial within-group variability. Because the only significant gender differences that were found were with the two most highly stereotyped toys, the doll and the truck, the following analyses focus on these two toys.

Play with the doll and truck—To examine age and sex differences in play, a series of 2 (age: 17 and 21 months) × 2 (gender) repeated-measures ANOVAs were conducted for proportions of play time with the doll and the truck. The analysis for play with the doll resulted in a significant main effect for gender, F (1,80) = 7.32, p = .008, partial η^2 = .084, with girls showing greater levels of doll play than boys. However, this main effect was qualified by a significant Gender by Age interaction, F (1,80) = 6.30, p = .014, partial η^2 = .073, with girls increasing their play with the doll and boys decreasing their play with the doll over development. Thus, as shown in Table 3, the sex difference was significant only at 21 months. The analysis for play with the truck resulted in a significant main effect for gender, F (1,80) = 12.14, p = .001, partial η^2 = .13, indicating that boys spent a greater amount of time playing with the truck. There was no significant Gender by Age interaction for this variable, F (1,80) = .21, p = .73.

Because sex differences in play were found only for the doll and the truck and relative play with these toys appeared to change over time, we created variables for sex-typed play at 17 and 21 months that reflected *relative* patterns of play with these two toys. For girls, these variables were calculated by subtracting the proportion of time spent playing with the truck from the proportion of time spent playing with the doll, and for boys, the reverse. Thus, positive values indicate a greater amount of play with the toy stereotyped for one's own gender relative to the toy stereotyped for the other gender, and negative values indicate the reverse. A 2 (age: 17 and 21 months) × 2 (gender) repeated-measures ANOVA on sex-typed play resulted in a

significant main effect for age, with both boys and girls increasing their sex-typed play from 17 ($M = .05$, $SD = .23$) to 21 months ($M = .13$, $SD = .27$), $F (1,80) = 4.73$, $p = .033$, partial $\eta^2 = .056$, and a significant main effect for gender $F (1,80) = 10.45$, $p = .002$, partial $\eta^2 = .12$, indicating that girls ($M = .15$, $SD = .24$) engaged in a higher level of sex-typed play than boys ($M = .02$, $SD = .25$) at both ages. There was no significant interaction between Gender and Age, $F (1,80) = .38$, $p = .54$.

Relation between Gender Labeling and Sex-Typed Play

The final set of analyses investigated whether the three gender labeling variables - number of labels produced, production of both *girl* and *boy*, and presence of self-labeling – predicted change in sex-typed play from 17 to 21 months when children played alone. The dependent variable, change in sex-typed play, was calculated by subtracting sex-typed play at 17 months from sex-typed play at 21 months, such that positive values indicated increases in sex-typed play from 17 to 21 months and negative values indicated the opposite. All analyses were additionally conducted with age of 50 words and level of symbolic play at 17 months as control variables.

Number of gender labels produced—A multiple regression analysis was conducted on change in sex-typed play using the number of gender labels and gender as predictors. Because only one child produced more than four labels, the number of labels variable range = 1 to 4, with 4 indicating four or more labels. The number of gender labels was a significant predictor of an increase in sex-typed play, $R^2 = .067$, $b = .07$, and $t (3,72) = 2.16$, $p = .034$. Gender and the interaction between gender and the number of labels were not significant predictors of change in sex-typed play, $b = .11$, $t (3,72) = .97$, $p = .34$, $b = −.05$, and $t (3,72) = −1.20$, $p = .24$, respectively. The same relation between number of gender labels and increase in sex-typed play remained significant when controlling for age of 50-word productive vocabulary ($p = .049$) and for level of symbolic play at 17 months ($p = .038$). These results are thus consistent with the hypothesized relation between gender labeling and sex-typed play for both boys and girls.

Production of both Girl and Boy—To test whether children who had produced both *girl* and *boy* were more likely than other children to increase their sex-typed play, change in sex-typed play was regressed on gender and a binary variable indicating the presence or absence of *boy* and *girl* in children's productive vocabularies. Results indicated that producing both *boy* and *girl* was a significant predictor of an increase in sex-typed play, $R^2 = .10$, $b = .32$, $t (3,72) = 2.62$, $p = .011$ (see Table 4 for group means). Gender and the interaction between gender and production of *boy* and *girl* were not significant predictors of change in play, $b = .07$, $t (3,72) = .83$, $p = .41$, and $b = −.24$, $t (3,72) = −1.57$, $p = .12$. The same relations held when controlling for age of 50 word productive vocabulary ($p = .02$) and for level of symbolic play at 17 months ($p = .011$). These findings indicate that children who know the labels for own- and opposite-gender children are more likely than children who know other combinations of labels or just one or no labels to increase their sex-typed play.

Gender self-labeling—To test whether the presence of gender self-labeling predicts increases in sex-typed play, change in sex-typed play was regressed on self-labeling. Because of the small number of boys who had self-labeled, gender was not included in the regression equation. Gender self-labeling was a significant predictor of increases in sex-typed play, $R^2 = .06$, $b = .20$, $t (1,74) = 2.20$, $p = .031$ (see Table 4). This relation remained significant when controlling for age of the 50-word milestone ($p = .037$) and level of symbolic play at 17 months ($p = .031$). These results indicate that a basic gender identity, as demonstrated by the presence of gender self-labeling, was associated with increased levels of sex-typed play from 17 to 21 months.

Child Playing with Mother

As a supplementary analysis, all of the same analyses were conducted for toy play times in the session in which children played with their mothers. We were interested in investigating whether mothers' involvement in play increased the stereotyped nature of children's play, thus suggesting the role of maternal socialization rather than self socialization in the development of the sex-typed play observed when children played alone.

A similar pattern of results was found for age and gender differences in play times, although few differences were significant. Boys did not play with the truck for a significantly greater proportion of time ($M = .09$, $SD = .14$) than the girls ($M = .07$, $SD = .09$) at 17 months, $t (80) = .67$, p = .51. However, at 21 months, boys did play significantly longer with the truck ($M = .11$, $SD = .11$) relative to girls ($M = .06$, $SD = .09$), $t (80) = 2.59$, $p = .013$. Girls did not spend a significantly greater amount of time with the doll (17 months $M = .18$, $SD = .19$, 21 months $M = .20$, $SD = .21$) compared to boys (17 months $M = .16$, $SD = .17$, 21 months $M = .13$, $SD = .14$) at either age, t (80) = −.41, $p = .68$, t (80) = −1.55, p = .11.

To investigate changes in the relative patterns of play with both the doll and the truck, sex-typed play variables were calculated at 17 and 21 months by subtracting the proportion of play with the truck from the proportion of play with the doll for girls and the reverse for the boys, as was done for the analyses of the children playing alone. A 2 (age: 17 and 21 months) × 2 (gender) repeated measures ANOVA was conducted on the sex-typed play variables that resulted in a main effect for gender, $F (1,80) = 26.92$, $p = .000$, partial $\eta^2 = .25$. An inspection of the means indicates that girls engaged in more sex-typed play at both ages ($M = .11$, $SD = .20$, and $M = .14$, $SD = .23$) than the boys ($M = −.08$, $SD = .21$, and $M = −.02$, $SD = .16$), consistent with the playing alone session. There was no significant effect for age, $F (1,80) = 2.10$, $p = .15$. Change in sex-typed play (calculated as sex-typed play at 17 months subtracted from sex-typed play at 21 months, as in the child playing alone analyses) was also regressed on the two labeling variables and no significant or marginally significant relations were found.

To test whether the presence of mothers tended to lessen, rather than strengthen, the appearance of sex-typed play, a 2 (gender) × 2 (age: 17 and 21 months) × 2 (play session: alone or with mother) mixed design ANOVA was conducted on sex-typed play with age and play session as within subjects variables and gender as a between-subjects variable. This analysis resulted in a significant effect of play session, $F (1,80) = 4.69$, $p = .033$, partial $\eta^2 = .055$. An inspection of the means indicated that on average, children engaged in less sex-typed play when playing with their mothers ($M = .05$, $SD = .22$) than when playing alone ($M = .09$, $SD = .25$). There were no significant two- or three-way interactions. Furthermore, when children played with their mothers, there was no evidence of the relation between sex-typed play and gender labeling found when children played alone. These findings suggest that if anything, this group of middle to upper-middle class mothers are socializing gender-neutral play, and that children are more sex typed in their solitary play even at these young ages.

Discussion

This study had two principal aims: (1) to provide a close investigation of the emergence of gender category knowledge, as demonstrated through children's first use of gender labels and (2) to investigate whether this knowledge is related to the development of sex-typed behaviors. Although previous studies have investigated gender labeling using experimental formats, such as pointing and sorting tasks, the present study used a non-obtrusive method that had the advantage of avoiding the task-related difficulties of previous measures. Also, the methods used were ecologically valid and naturalistic. Furthermore, the longitudinal, biweekly observations used in this study presented a unique opportunity to conduct event history analyses that illuminate potential processes involved in the acquisition of gender category knowledge.

Overall, the results of this study provide support for the idea that gender category knowledge begins to emerge in the second year of life and is related to the development of sex-typed behavior. These findings are consistent with the self socialization hypothesis that the development of early sex-typed attributes is influenced by the ability to categorize oneself and others according to gender.

The Emergence of Gender Category Knowledge

Overall, infants used gender labels by 18–21 months, and by 21 months, most used multiple labels. This is considerably earlier than the 2- to 3-year-old age range at which children have been found to pass experimenter-designed labeling tasks. Indeed, these results are consistent with maternal reports that most children produce the words *girl*, *boy,* and *man* by the time that they are 20–22 months old (Fenson et al., 1994; they did not report results for *woman*, although they found that *lady* is used by 26 months). Although only 17% of our sample self-labeled, this is a likely underestimate of children's self-labeling. Rather than directly asking parents whether their children self-labeled, self-labeling was coded from mothers' biweekly reports of their children's new words and sentences.

Given the discrepancies between verbal and non-verbal labeling measures, it is possible that the task-demands and stimuli presented in non-verbal measures to date have led to underestimates of children's gender category knowledge. For instance, sorting tasks might be too difficult for young children (Zelazo & Reznick, 1991). Pointing tasks that rely on photographs of heads and necks, particularly those using pictures of children, might not make gender as salient as it is in real life, where children view their peers' entire bodies. Gender is apparent in the facial features of adults, but the gender of children is made evident through a combination of clothing, accessories, and hair. This greater difficulty in discriminating the images of children has been demonstrated in studies in which infants could correctly categorize head and shoulder photographs of adults by 24 months, but could not classify children until about 30 months (e.g., Fagot et al., 1986).

The survival analyses in this study had the additional advantages of providing estimates of first use of gender labels that were unbiased in their accounting of children who had not yet produced gender labels. These analyses revealed that girls produced labels consistently earlier than boys, even when adjusting for general language development. Although the present data do not address why girls acquire gender category knowledge before boys, this finding both speaks to the value of more detailed, continuous analyses of early gender development and highlights the need to further investigate the factors involved in the development of gender category knowledge and sex-typed behaviors before the age of 2. It is possible that other gender differences in cognitive development that were not measured in this study, such as a more direct test of categorization abilities, might account for the gender difference in timing of gender labeling.

Socialization processes might also explain these gender differences. For instance, girls may experience more consistent exposure to female gender role models through female caregivers. Or, gender may be initially more salient for girls because of the distinctiveness of "girly" clothes and decorations (e.g., pink frilly dresses; Ruble, Lurye, & Zosuls, 2007). Boys' clothing is comparatively less stereotyped, and it might be more difficult to learn that part of being a boy is avoiding "girly" things compared to learning what things to approach and embrace. In general, previous research has found that, if appearance stereotypes are stronger when children think of girls, trait-like attributes are more salient as stereotypes of boys (Miller, Lurye, Zosuls, & Ruble, 2008). Perhaps when they are very young, both boys and girls are treated and viewed in a more "feminine" manner (e.g., cute, cuddly, dependent). It may not be until children acquire better motor skills and are physically stronger and able to do things more on their own, that parents begin to more overtly socialize male attributes, such as sports and rough and tumble

play activities, and thereby make gender more salient to boys (e.g., "Don't throw that ball like a girl!"). Nevertheless, parents provide sex-typed environments for both girls and boys (Pomerleau, Bolduc, Malcuit, & Cossette, 1990; Rheingold & Cook, 1975) and hold early gender-based expectations (e.g., Mondschein, Adolph, & Tamis-LeMonda, 2000). Therefore, it is difficult to determine whether there is a perceptible difference for children in the salience of one gender category compared to the other. Future research might help to illuminate the potential role of socialization processes in girls' earlier acquisition of gender labels by investigating how parent socialization might change over time during early development.

Research on gender differences in language acquisition also suggests that girls and boys might acquire language in different ways and experience different language-learning environments (e.g., maternal behaviors) (e.g., Karrass, Braungart-Rieker, Mullins, & Lefever, 2002). Such differences could affect both the timing and the content of children's early vocabulary development. In fact, recent research has reported gender differences in the content of children's early vocabularies (Stennes et al., 2005; Wehberg, Vach, Bleses, Thomsen, Madsen, & Basboll, 2008). For instance, compared to boys, girls learn more words focused on social relationships (e.g., *grandmother*), but boys compared to girls tend to learn more words related to objects that move, are loud, and can be acted on (e.g., *car*, *door*) (Wehberg et al., 2008). Thus, girls might be more likely to learn words for gender labels because of a greater focus on social relationships. By contrast, boys might be more likely to learn words for male sex-typed toys, such as cars and trucks, and engage in early sex-typed behaviors because of this early attention to such objects. Ongoing research of the language diaries used in the present study also indicates significant gender differences in the content of children's broader vocabularies that are consistent with previous research (Zosuls, Bernstein, Chladek, Ruble, & Tamis-LeMonda, 2008). Future research should further investigate these and other cognitive developmental and socialization processes to better understand why girls learn gender labels earlier than boys.

The results also speak to the value of studying the role of labeling in early gender development. Evidence from research in other domains has shown that labeling helps to highlight categories and supports the discovery of novel concepts (Waxman & Lidz, 2006). This perspective suggests that the acquisition of gender labels might promote the development of gender concepts. Research showing that "gender-ostensive" labeling (i.e., labeling intended to convey gender information per se with no other content) is higher in mother-child conversations about a picture book with 2 year old children than in conversations with 4 and 6 year olds (Gelman et al., 2004). This finding suggests that gender categories are a particular focus of attention (in terms of verbal labeling) by the time children are 2 years old.

Observations of Gender-typed Play

The present findings indicated that, although boys and girls were more similar than different in their choice of toys and exhibited considerable variability in their play, there was evidence for sex-typed play at both time points. While there were modest sex differences in play with the truck at 17 months that remained at 21 months, relative sex-typed preferences with the doll and the truck increased between 17 and 21 months.

The lack of sex differences in play with other toys, such as the tea set, brush and comb set, and blocks, calls for more investigation given that these toys are often stereotyped as female or male typical. At young ages, the gender-typed nature of tea sets and brush and comb sets might not be readily apparent to children, as both boys and girls routinely drink from cups, use spoons and plates to eat, and have their hair groomed. Our informal observations of their play indicated that both boys and girls frequently re-enacted familiar meal time scenarios and hair brushing and combing routines with these toy sets. Thus, even though tea sets and brush and comb sets might be considered female stereotyped because they are related to appearance (in the case of

the brush and comb) and social play (Blakemore & Centers, 2005), the gender stereotyped nature of these toys might not be salient to very young children who have regular experiences with these objects in their daily lives. It might not be until children are slightly older and learn more gender stereotyped scripts, such as those related to nurturing, that girls play more with these toys in comparison with boys. For instance, when children first develop a gender identity, they are likely to have very limited gender schemas that consist of only the most salient gender-related attributes (e.g., "girls play with dolls"). However, as children elaborate their gender schemas, they should learn a wider repertoire of objects and activities associated with males and females (e.g., "girls should look pretty"). It is also unclear to what extent wooden blocks are male stereotyped. It is possible that blocks are currently seen as a neutral "educational" toy beneficial for both boys and girls. Indeed, one recent study found that adults rated wooden blocks as neutral (Blakemore & Centers, 2005) and another found that "building blocks" were rated as only moderately masculine (Campenni, 1999). Nevertheless, boys, but not girls, name manipulative toys such as blocks and Legos among their favorite toys (Cherney & London, 2006). These results highlight the need to investigate the nature of sex-differences in play more closely and to analyze play with individual toys, rather than rely on stereotypes of toys, especially with very young children, as studies based on groupings of stereotyped toys might obscure true differences and meaningful patterns in the development of sex-typing.

A strength of the present study was the measurement of sex-typed play when children played alone as the main dependent variable. Aside from minimizing the role that mothers might have played in influencing their children's play, analyses of children's play with their mothers revealed that mothers might influence sex-typed behaviors in surprising directions. Rather than strengthening gender differences, gender differences were attenuated when children played with their mothers. With the exception of truck play at 21 months, the gender differences in play with the doll and the truck were no longer apparent when children played with their mothers. Results investigating children's relative play with the doll and the truck (i.e., the sex-typed play difference score) also indicated that children engaged in less sex-typed play when with their mothers, although girls still engaged in significantly greater levels of sex-typed play compared to boys, as they did in the alone play session. Overall, these results speak to the importance of considering context in investigations of children's early sex-typed behaviors.

Relation between Gender Category Knowledge and Gender-typed Play and Relation to Theory

Results indicated that gender category knowledge acquired during the second year was related to increases in sex-typed play from 17 to 21 months. These results support and extend prior research findings in which gender-labeling by 27 months was associated with a more extensive array of gender-typed behavior (Fagot & Leinbach, 1989) This kind of self socialization process may begin much earlier than has been previously documented, indicating that children's knowledge of gender categories may precede other gender-typed behavior. Thus, critiques of self socialization theories that are based on the "ordering" of gender-based play relative to gender knowledge should be re-evaluated (Bandura & Bussey, 2004; Martin et al., 2004).

Although further research is needed to investigate mediating processes involved in self socialization, our analyses of the relation between three different types of labeling variables and change in sex-typed play also provides suggestive evidence for the processes that are thought to drive self socialization. For instance, the finding that knowing both boy and girl and self-labeling were significant predictors of increases in sex-typed play suggests that children demonstrating these forms of gender labeling might have developed schemas for own- and opposite-gender children that guided their play. In other words, according to the self socialization perspective, children who understand that their social worlds are divided into boys and girls and that they belong to one of these groups will become motivated to acquire

knowledge about the two groups and their own group in particular and shape their own behavior to fit these stereotypes.

Limitations

The present data do not provide evidence of causality. Future research should more closely examine the association between gender category knowledge and sex-typed play in the 17- to 30-month age range using longitudinal investigations. It is possible that differential play with the doll and truck, albeit quite weak at the earlier assessment, promoted gender labeling, rather than the reverse. It is also possible that a third variable, such as cognitive maturity or socialization processes, affected both the emergence of labeling and gender-typed play without children's knowledge of gender categories playing a mediating role in the development of gender-typed play. However, our inclusion of measures of language and play development as covariates indicates that the relations observed were specific to gender labels, not language or play sophistication more generally. Language and play development are thought to be closely tied to conceptual development in a powerful, synergistic relation (e.g., Waxman & Lidz, 2006; Nelson, 2005) and it is therefore likely that these variables also captured and adjusted for important aspects of cognitive development.

If socialization processes were the main determinant of the relations observed, it would seem likely that more gender-typed play would occur in the mother-present session, but that did not occur. If anything, there was less such play, suggesting perhaps that this group of mothers may have been promoting egalitarian play, rather than gender-typed play, an observation noted in prior research (Ruble, Martin, & Berenbaum, 2006). However, it is possible that other factors, such as the presence of the researchers, might have affected mothers' behaviors. For instance, in an effort to be "good participants" and engaged in play with their children, mothers might have been more likely to encourage play with female-stereotyped toys, which tend to be more amenable to complex play (Cherney et al., 2003). Such demand effects could have led to the low observed levels of sex-typed play among boys, but not girls during this play session. It also remains possible that fathers influenced both labeling and gender-typed play, especially because fathers have been shown to be important socializers of gender-typed behavior (Caldera & Sciaraffa, 1998; Fagot & Hagan, 1991; Langlois & Downs, 1980; Leaper, Anderson, & Sanders, 1998) and language and cognitive development more generally (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004).

Finally, although maternal reports correlate highly with both observation and testing of children (Bornstein & Haynes, 1998), they are still subject to bias. Mothers were given language inventories to refer to, however, the creation of the diaries depended on mothers' reports given over the telephone in response to questions and probes. Mothers might have misremembered the labels that children learned and might have overestimated (or underestimated) the degree to which children had flexibly produced gender labels. Such bias could have affected our results, especially if mothers with more sex-typed children were more likely to take notice of their children's production of gender labels. Similarly, it is possible that mothers with more gendered expectations for their children might have been both more likely to remember their children's production of gendered words and were more likely to engage in socialization practices that might have led to greater levels of observed gender stereotyped play. However, mothers were extensively probed for many aspects of general language development and a large number of words, of which gender labels only constituted a very small proportion, thus minimizing the degree to which gender was made salient during data collection. Furthermore, as stated earlier, we believe that our measure of self-labeling underestimated the number of children who self-labeled because mothers were not specifically probed for this information, or any other information that would have made gender particularly salient. Such an underestimation could have weakened our results, but it could also have had the opposite effect

if mothers with more sex-typed children were more likely to spontaneously recall their children referring to themselves by gender.

Future Directions

Issues of multiple influences and causal direction remain important questions for future research. The sex difference in truck play seen at 17 months, for example, cannot be accounted for by self socialization processes, and thus, biological or familiarity (e.g., trucks more likely to be in the homes of boys) factors, seem implicated. It would be interesting in future studies to evaluate simultaneously likely biological indices (e.g., interest in motion), socialization indices (e.g., presence of gender-typed toys and colors in the home), and gender category knowledge, as they influence the emergence of gender-typed play, during the first 2–3 years of life.

Despite widespread stereotypes of children's toy and activity preferences, more research is needed about the nature of sex differences in play before the age of 2. Subsequent analyses of our data revealed that differences were evident in the types of play boys and girls engaged in with the doll and the truck (Zosuls, Schaller, Ruble, & Tamis-LeMonda, 2006). For instance, we found that boys spent a significantly greater amount of time than girls opening and closing the doll's eyes at both 17 and 21 months. At 21 months, girls spent a greater amount of time engaging in nurturing activities with the doll, such as cuddling it. These findings suggest that children might be drawn to toys for their affordances to engage in certain types of play and that, in turn, the affordances of toys might also foster and reinforce certain types of behaviors. Isolating different types of play behaviors and particular features of toys that might differentially appeal to girls and boys at different points in development might help to further disentangle the social, cognitive, and biological determinants of sex differences.

Conclusion

The present findings add to the growing number of indications that children's recognition of gender categories begins younger than previously thought. Most of the infants in the present study had at least one gender label in their productive vocabulary, many had more, and some were able to label themselves as a boy or a girl before 22 months of age. The event history analyses pointed to gender differences in the timing of the emergence of gender labeling that were not accounted for by differences in general language abilities. These data also speak to the value of studying early gender development along a continuum rather than at fixed time points or age groupings and using statistical approaches that are able to model meaningful patterns and shifts in development. Just as children develop rapidly in a variety of cognitive domains during the second and third years (e.g., Baldwin & Moses, 1996; Bloom, 1998; Nelson, 1973; Tamis-LeMonda & Bornstein, 1996), processes related to gender development may likewise unfold during this age range that may not be as readily detected when children are studied using broader age groupings or fewer time points.

This study also found that sex-typed play with a truck and a doll increased between 17 and 21 months and was related to knowledge of greater numbers of gender labels and self-labeling. These results support the perspective of self socialization theories; children's knowledge about gender categories occurs at least as early as gender-typed play behaviors and is associated with increases in such play behavior. In short, critiques of gender self socialization theories that are founded on the premise that gender-typed play precedes gender category knowledge will need to be re-evaluated.

Acknowledgments

References

Baldwin DA, Moses LJ. The ontogeny of social information gathering. Child Development 1996;67:3135–3153. [PubMed: 9071774]

Bandura A, Bussey K. On broadening the cognitive, motivational, and sociocultural scope of theorizing about gender development and functioning: Comment on Martin, Ruble, and Szkrybalo (2002). Psychological Bulletin 2004;130(5):691–701. [PubMed: 15367076]

Baron, AS.; Dunham, YC.; Banaji, MR.; Carey, SE. Constraints on social-category based inferences. Paper presented at the 2007 Biennial Meeting of the Society for Research on Child Development; Boston, MA. 2007 Mar.

Bates, E.; Bretherton, I.; Snyder, L. From first words to grammar: Individual differences and dissociable mechanisms. Cambridge, U.K: Cambridge University Press; 1988.

Bates, E.; Dale, P.; Thal, D. Individual differences and their implications for theories of language development. In: Fletcher, P.; MacWhinney, B., editors. The handbook of child language. Oxford England: Blackwell; 1995. p. 96-151.

Bem SL. Gender schema theory: A cognitive account of sex typing. Psychological Review 1981;88:354–364.

Benedict H. Early lexical development: Comprehension and production. Journal of Child Language 1979;6:183–200. [PubMed: 468932]

Bigler RS. The role of classification skill in moderating environmental influences on children's gender stereotyping: A study of the functional use of gender in the classroom. Child Development 1995;66:1072–1087.

Bigler RS, Jones LC, Lobliner DB. Social categorization and the formation of intergroup attitudes in children. Child Development 1997;68:530–543. [PubMed: 9249964]

Blakemore JEO, Centers RE. Characteristics of boys' and girls' toys. Sex Roles 2005;53:619–633.

Bloom, L. One word at a time: The use of single word utterances before syntax. The Hague, The Netherlands: Mouton; 1973.

Bloom, L. The transition from infancy to language: Acquiring the power of expression. Cambridge: Cambridge University Press; 1993.

Bloom, L. Language acquisition in its developmental context. In: Kuhn, D.; Siegler, RS.; Damon, W., editors. Handbook of Child Psychology, 5th Edition, Cognition, Perception and Language. New York: Wiley; 1998. p. 309-370.

Booth AE, Waxman S. Object names and object functions serve as cues to categories for infants. Developmental Psychology 2002;38:948–957. [PubMed: 12428706]

Bornstein MH, Hahn C, Haynes OM. Specific and general language performance across early childhood: Stability and gender considerations. First Language 2004;24:267–304.

Bornstein MH, Haynes OM. Vocabulary competence in early childhood: Measurement, latent construct, and predictive validity. Child Development 1998;69:654–671. [PubMed: 9680678]

Bornstein MH, Haynes OM, Pascual L, Painter KM, Galperin C. Play in two societies: Pervasiveness of process, specificity of structure. Child Development 1999;70:317–331. [PubMed: 10218257]

Brooks-Gunn J, Lewis M. "Why Mama and Papa?" The development of social labels. Child Development 1979;50:1203–1206.

Bussey K, Bandura A. Social cognitive theory of gender development and differentiation. Psychological Review 1999;106:676–713. [PubMed: 10560326]

Caldera YM, Huston AC, O'Brien M. Social interactions and play patterns of parents and toddlers with feminine, masculine and neutral toys. Child Development 1989;60:70–76. [PubMed: 2702876]

Caldera YM, Sciaraffa MA. Parent-toddler play with feminine toys: Are all dolls the same? Sex Roles 1998;39:657–668.

Campenni CE. Gender stereotyping of children's toys: A comparison of parents and nonparents. Sex Roles 1999;40:121–138.

Cherney ID, Kelly-Vance L, Glover KG, Ruane A, Ryalls BO. The effects of stereotyped toys and gender on play assessment in children aged 18–47 months. Educational Psychology 2003;23:95–105.

Cherney ID, London K. Gender-linked differences in the toys, television shows, computer games, and outdoor activities of 5- to 13-year-old children. Sex Roles 2006;54:717–726.

Damast AM, Tamis-LeMonda CS, Bornstein MH. Mother-child play: Sequential interactions and the relation between maternal beliefs and behaviors. Child Development 1996;67:1752–1766. [PubMed: 8890505]

Diesendruck G, haLevi H. The role of language, appearance, and culture in children's social category-based induction. Child Development 2006;77:539–553. [PubMed: 16686787]

Etaugh C, Grinnell K, Etaugh A. Development of gender labeling: Effect of age of child pictured. Sex Roles 1989;23:215–222.

Fagot BI, Hagan R. Observations of parent reactions to sex-stereotyped behaviors: Age and sex effects. Child Development 1991;62:617–628. [PubMed: 1914629]

Fagot BI, Leinbach MD. Gender-role development in young children: From discrimination to labeling. Developmental Review 1993;13:205–244.

Fagot B, Leinbach M. The young child's gender schema: environmental input, internal organization. Child Development 1989;60:663–672. [PubMed: 2737015]

Fagot BI, Leinbach MD, Hagan R. Gender labeling and the adoption of sex-typed behaviors. Developmental Psychology 1986;22:440–443.

Fagot BI, Leinbach MD, O'Boyle C. Gender labeling, gender stereotyping, and parenting behaviors. Developmental Psychology 1992;28:225–230.

Fein G, Johnson D, Kosson N, Stork J, Wasserman L. Sex stereotypes and preferences in the toy choices of 20-month-old boys and girls. Developmental Psychology 1975;11:527–528.

Feldman HM, Dale PS, Campbell TF, Colborn DK, Kurs-Lasky M, Rockette HE, Paradise JL. Concurrent and Predictive Validity of Parent Reports of Child Language at Ages 2 and 3 Years. Child Development 2005;76:856–868. [PubMed: 16026501]

Fenson L, Dale PS, Resznick JS, Bates E, Thale DJ, Pethick SJ. Variability in early communicative development. Monographs of the Society for Research in Child Development 1994;59(5)

Flavell, JH.; Miller, PH. Social cognition. In: Damon, W.; Kuhn, D.; Siegler, RS., editors. Handbook of child psychology: Vol. 2. Cognition, perception, and language. Vol. 5th ed. New York: Wiley; 1998. p. 851-898.

Gelman SA, Heyman GD. Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories. Psychological Science 1999;10:489–493.

Gelman SA, Taylor MG, Nguyen S. Mother-child conversations about gender: Understanding the acquisition of essentialist beliefs. Monographs of the Society for Research in Child Development 2004;Volume 69(No 1)

Giles JW, Heyman GD. When to cry over spilled milk: Young children's use of category information to guide inferences about ambiguous behavior. Journal of Cognition and Development 2004;5:359–382.

Goldberg S, Lewis M. Play behavior in the year-old infant: Early sex differences. Child Development 1969;40:21–31. [PubMed: 5787704]

Goldfield BA, Reznick JS. Early lexical acquisition: Rate, content, and the vocabulary spurt. Journal of Child Language 1990;17:171–183. [PubMed: 2312640]

Haight W, Wang K, Fung H, Williams K, Mintz J. Universal, developmental and variable aspects of young children's play a cross-cultural comparison of pretending at home. Child Development 1999;70:1477–1488. [PubMed: 10621968]

Hosmer, DW.; Lemeshow, S. Applied survival analysis: Regression modeling of time to event data. New York: Wiley; 1999.

Joseph RM. Intention and knowledge in preschoolers' conception of pretend. Child Development 1998;69:979–990.

Karrass J, Braungart-Rieker JM, Mullins J, Lefever JB. Processes in language acquisition: The roles of gender, attention, and maternal encouragement of attention over time. Journal of Child Language 2002;29:519–543. [PubMed: 12109362]

Katz, PA.; Kofkin, JA. Race, gender, and young children. In: Luthar, SS.; Burack, JA.; Cicchetti, D.; Weisz, JR., editors. Developmental psychopathology: Perspectives on adjustment, risk, and disorder. New York: Cambridge University Press; 1997. p. 51-74.

Katz PA, Seavey C. Labels and children's perception of faces. Child Development 1973;44:770–775. [PubMed: 4751299]

Kavanaugh, RD.; Harris, PL. Pretense and counterfactual thought in young children. In: Balter, L.; Tamis-Lemonda, CS., editors. Child psychology: A handbook of contemporary issues. Philadelphia, PA: Psychology Press; 1999. p. 158-176.

Kohlberg, L. A cognitive-developmental analysis of children's sex-role concepts and attitudes. In: Maccoby, EE., editor. The Development of Sex Differences. Stanford: Stanford University Press; 1966. p. 82-173.

LaFreniere P, Strayer FF, Gauthier R. The emergence of same-sex affiliative preferences among preschool peers: A developmental/ecological perspective. Child Development 1984;55:1958–1965.

Langlois JH, Downs CA. Mothers, fathers, and peers as socialization agents of sex-typed play behaviors in young children. Child Development 1980;51:1237–1247.

Leaper C, Anderson KJ, Sanders P. Moderators of gender effects on parents' talk to their children: A meta-analysis. Developmental Psychology 1998;34:3–27. [PubMed: 9471001]

Liben SL, Bigler RS. The developmental course of gender differentiation: Conceptualizing, measuring and evaluating constructs and pathways. Monographs of the Society for Research in Child Development 2002;67:1–147.(2, Serial No. 269)

Lillard AS. Wanting to be it: Children's understanding of intentions underlying pretense. Child Development 1998;69:979–991.

Maccoby, EE.; Jacklin, CN. The psychology of sex differences. Stanford, CA: Stanford University Press; 1974.

Martin CL, Halverson C. A schematic processing model of sex typing and stereotyping in children. Child Development 1981;52:1119–1134.

Martin CL, Ruble DN, Szkrybalo J. Cognitive theories of early gender development. Psychological Bulletin 2002;128:903–933. [PubMed: 12405137]

Martin CL, Ruble DN, Szkrybalo J. Recognizing the centrality of gender identity and stereotype knowledge in gender development and moving toward theoretical integration: Reply to Bandura and Bussey (2004). Psychological Bulletin 2004;130(5):702–710. [PubMed: 15367077]

Menon, M.; Tobin, DD.; Menon, M.; Perle, JG.; Perry, DG. Self-socialization of gender. Poster presented at the Biennial Meeting of the Society for Research on Child Development; Boston, MA. 2007 Mar.

Miller CF, Lurye LL, Zosuls KM, Ruble DN. Content and accessibility of children's gender stereotypes: Girls are what they look like and boys are what they do. Manuscript submitted for publication. 2008

Mischel, W. A Social-learning view of sex differences in behavior. In: Maccoby, EE., editor. The Development of Sex Differences. Stanford, Ca: Stanford University Press; 1966. p. 56-81.

Mondschein ER, Adolph KE, Tamis-LeMonda CS. Gender bias in mothers' expectations about infants crawling. Journal of Experimental Child Psychology 2000;77:304–316. [PubMed: 11063631]

Nazzi T, Gopnik A. Linguistic and cognitive abilities in infancy: When does language become a tool for categorization? Cognition 2001;80:B11–B20. [PubMed: 11274987]

Nelson K. Structure and strategy in learning to talk. Monographs of the Society for Research in Child Development 1973;Vol. 38(1–2, Serial No. 149).

Nelson, K. Cognitive functions of language in early childhood. In: Homer, BD.; Tamis-LeMonda, CS., editors. The development of social cognition. Mahwah, NJ: Lawrence Erlbaum Associates; 2005. p. 7-28.

O'Brien MH, Huston AC. Development of sex-typed play behavior in toddlers. Developmental Psychology 1985;21:866–871.

O'Brien MH, Huston AC, Risley TR. Sex-typed play of toddlers in a day care center. Journal of Applied Developmental Psychology 1983;4:1–9.

Perry DG, White AJ, Perry LC. Does early sex-typing result from children's attempts to match their behavior to sex role stereotypes? Child Development 1984;55:2114–2121.

Pomerleau A, Bolduc D, Malcuit G, Cossette L. Pink or blue : Environmental gender stereotypes in the first two years of life. Sex Roles 1990;22:359–367.

Poulin-Dubois D, Serbin LA, Derbyshire A. Toddlers' intermodal and verbal knowledge about gender. Merrill-Palmer Quarterly 1998;44:338–354.

Rheingold HL, Cook KV. The content of boys' and girls' rooms as an index of parents' behavior. Child Development 1975;46:459–463.

Roopnarine JL. Mothers' and fathers' behaviors toward the toy play of their infant sons and daughters. Sex Roles 1986;14:59–68.

Rogoff, B. Cognition as a collaborative process. In: Damon, W.; Kuhn, D.; Siegler, RS., editors. Handbook of Child Psychology, 5th Edition, Cognition perception and language. Vol. Vol. 2. New York: Wiley; 1998. p. 679-744.

Ruble, DN. A phase model of transitions: Cognitive and motivational consequences. In: Zanna, M., editor. Advances in experimental social psychology. Vol. 26. 1994. p. 163-214.

Ruble, DN.; Alvarez, J.; Bachman, M.; Cameron, J.; Fuligni, A.; Coll, CG.; Rhee, E. The development of a sense of "we": The emergence and implications of children's collective identity. In: Bennett, M.; Sani, F., editors. The development of the social self. New York: Psychology Press; 2004. p. 29-76.

Ruble, DN.; Lurye, LE.; Zosuls, KM. Pink Frilly Dresses (PFD) and early gender identity. Princeton Report on Knowledge. 2007. Retrieved from http://prok.princeton.edu/2-2/inventions/pink_frilly

Ruble, DN.; Martin, CL.; Berenbaum, S. Gender development. In: Kuhn, D.; Siegler, R., editors. Handbook of Child Psychology: Cognition, Perception and Language (6th Edition). New York: John Wiley & Sons; 2006.

Serbin LA, Poulin-Dubois D, Colburne KA, Sen MG, Eichstedt JA. Gender stereotyping in infancy: Visual preferences for and knowledge of gender-stereotyped toys in the second year. International Journal of Behavioral Development 2001;25(1):7–15.

Servin A, Bohlin G, Berlin L. Sex differences in 1-, 3-, and 5-year-olds' toy-choice in a structured play-session. Scandinavian Journal of Psychology 1999;40:43–48. [PubMed: 10216463]

Shrout PE, Fleiss JL. Intraclass Correlations: Uses in Assessing Rater Reliability. Psychological Bulletin 1979;2:420–428. [PubMed: 18839484]

Singer, JD.; Willett, JB. Applied longitudinal data analysis: Modeling change and event occurrence. New York: Oxford University Press; 2003.

Stennes LM, Burch MM, Sen MG, Bauer PJ. A longitudinal study of gendered vocabulary and communicative action in young children. Developmental Psychology 2005;41:75–88. [PubMed: 15656739]

Tajfel, H.; Turner, JC. The social identity theory of intergroup behavior. In: Worchel, S.; Austin, WG., editors. Psychology of Intergroup Relations, Second Edition. Chicago: Nelson-Hall; 1986. p. 7-24.

Tamis-LeMonda CS, Bornstein MH. Specificity in mother-toddler language-play relations across the second year. Developmental Psychology 1994;30:283–292.

Tamis-LeMonda, CS.; Bornstein, MH. Variation in Children's Exploratory, Nonsymbolic, and Symbolic Play: An Explanatory Multidimensional Framework. In: Rovee-Collier, C.; Lipsitt, L., editors. Advances in Infancy Research. Vol. 10. New Jersey: Ablex Publishers; 1996. p. 37-78.

Tamis-LeMonda CS, Bornstein M, Baumwell L. Maternal responsiveness and children's achievement of language milestones. Child Development 2001;72:748–767. [PubMed: 11405580]

Tamis-LeMonda, CS.; Cristofaro, TN.; Rodriguez, ET.; Bornstein, MH. Early language development: Social influences in the first years of life. In: Balter, L.; Tamis-LeMonda, CS., editors. Child Psychology: A Handbook of Contemporary Issues. Vol. 2nd Ed. New York: Psychology Press; 2006. p. 79-108.

Tamis-LeMonda CS, Shannon JD, Cabrera NJ, Lamb ME. Fathers and mothers at play with their 2- and 3-year-olds: Contributions to language and cognitive development. Child Development 2004;75:1806–1820. [PubMed: 15566381]

Thompson SK. Gender labels and early sex-role development. Child Development 1975;46:339–347. [PubMed: 1183267]

Waxman, SR.; Lidz, J. Early word learning. In: Kuhn, D.; Siegler, R., editors. Handbook of Child Psychology: Cognition, Perception and Language (6th Edition). New York: John Wiley & Sons; 2006.

Wehberg S, Vach W, Bleses D, Thomsen P, Madsen TO, Basboll H. Danish children's first words: Analysing longitudinal data based on monthly CDI parental reports. First Language 2008;27:361–383.

Weinraub M, Clemens LP, Sockloff A, Etheridge R, Gracely E, Myers B. The development of sex role stereotypes in the third year: Relationships to gender labeling, gender identity, sex-typed toy preferences, and family characteristics. Child Development 1984;55:1493–1503. [PubMed: 6488962]

Willett JB, Singer JD. Investigating onset, cessation, relapse, and recovery: Why you should, and how you can, use Discrete-Time Survival Analysis to examine event occurrence. Journal of Consulting and Clinical Psychology 2003;61:952–965. [PubMed: 8113496]

Zelazo PD, Reznick J. Age-related asynchrony of knowledge and action. Child Development 1991;62:719–735.

Zosuls, KM.; Bernstein, M.; Chladek, MR.; Ruble, DN.; Tamis-LeMonda, CS. Children's Knowledge of Gendered Words: A Test of Self-Socialization Theories of Gender Development. Poster presented at the Gender Development Research Conference; San Francisco, CA. 2008.

Zosuls, KM.; Schaller, AL.; Ruble, DN.; Tamis-LeMonda, CS. Beyond dolls and trucks: The relationship between gender identity and the nature of infants' sex-typed play. Poster presented at the Gender Development Research Conference; San Francisco, CA. 2006.
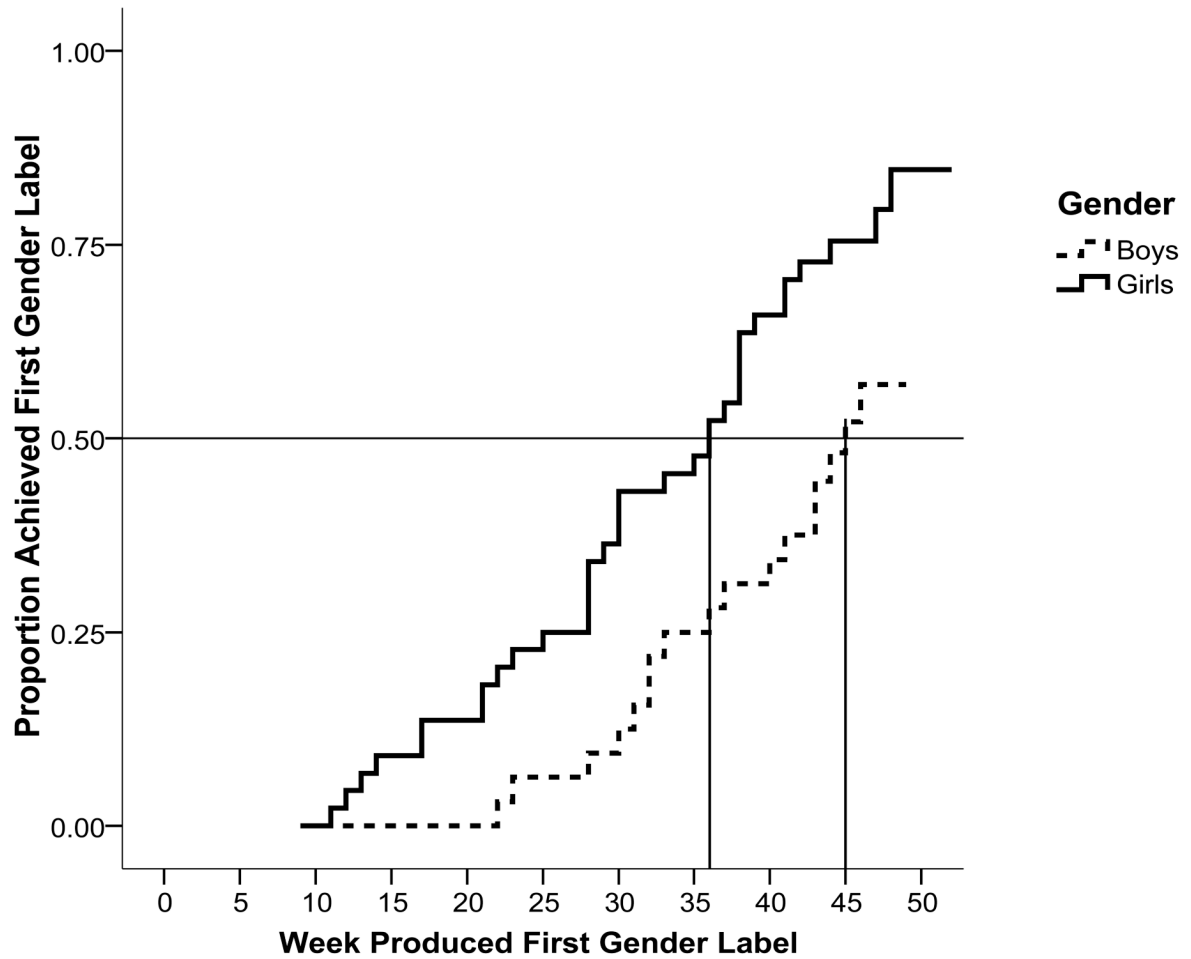
Figure 1.
Cumulative Probability Functions of Girls and Boys for First Gender Label using Kaplan-Meier Survival Analysis. Week 1 indicates average age of first word.
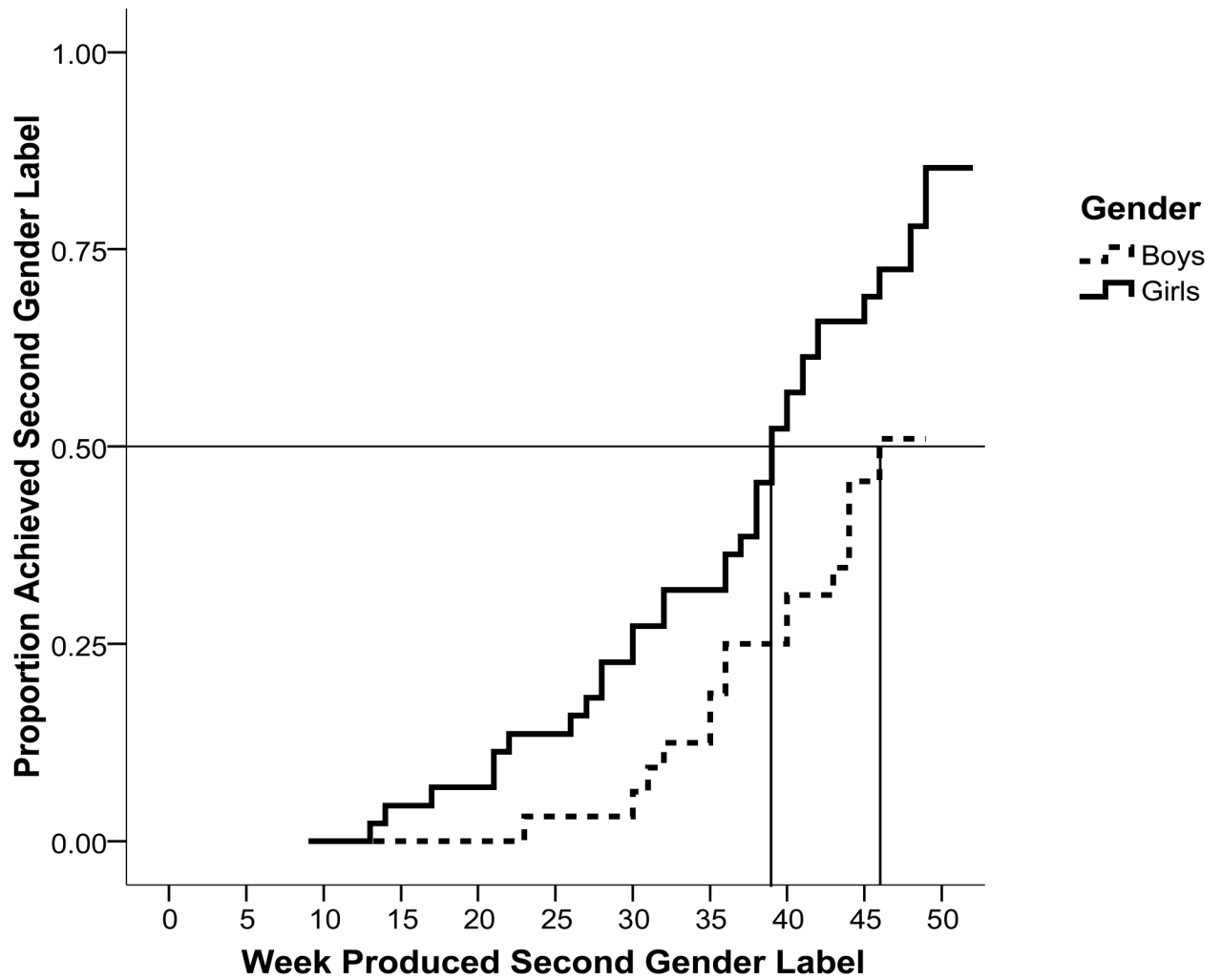
Figure 2.
Cumulative Probability Functions of Girls and Boys for Second Gender Label using Kaplan-Meier Survival Analysis. Week 1 indicates average age of first word.

Table 1

Percentage of Girls and Boys who produced each of the 6 Gender Labels as a First Gender Label

Gender Label	Male (n = 17)	Female (n = 35)
Girl	35%	57%
Boy	59%	51%
Lady	6%	3%
Man	47%	29%
Woman	6%	0%
Guy	12%	6%

Note: Label categories are not mutually exclusive because some children produced more than one label during the same 2-week period when they began gender labeling.

Table 2

Parameter Estimates of Cox Proportion Hazards Model Relating Gender and General Language Development (Age of 50 Words in Productive Vocabulary and Age of 1st Word) to the Instantaneous Probability of Producing the First and Second Gender Labels (n = 73)

	Transition to First Gender Label				
Variable	**Coefficient**	**SE**	**Wald**	**EXP(Coeff)**	**p**
Gender (Female)	.71	.31	5.19	2.04	.023
Age 50 Words	−.06	.02	10.73	.94	.001
Age of 1st Word	−.06	.03	2.76	.95	.096

	Transition to Second Gender Label				
Variable	Coefficient	SE	Wald	EXP(Coeff)	p
Gender (Female)	.71	.32	4.81	2.03	.028
Age 50 Words	−.07	.02	11.13	.94	.001
Age of 1st Word	−.05	.03	1.97	.95	.161

Table 3

Mean Proportions of Play Time (SD) by Toy, Gender, and Age for Children Playing Alone

	17 months		21 months	
Toy	Male (n = 36)	Female(n = 46)	Male (n = 36)	Female (n = 46)
Tea set	.31 (.24)	.33 (.24)	.31 (.31)	.27 (.20)
Doll	.13 (.20)	.15 (.18)	.09 (.10)	.25 (.27)[**]
Truck	.12 (.15)	.05 (.06)[*]	.13(.19)	.05 (.07)[*]
Telephone	.12 (.16)	.09 (.12)	.11 (.12)	.07 (.07)
People	.09 (.17)	.10 (.15)	.07 (.13)	.09 (.15)
Brush set	.07 (.12)	.08 (.11)	.08 (.07)	.06 (.07)
Nest cups	.04 (.05)	.08 (.09)	.05 (.06)	.07 (.09)
Blocks	.04 (.08)	.08 (.16)	.04 (.05)	.04 (.06)
Sponge	.04 (.07)	.05 (.15)	.03 (.05)	.04 (.09)

Note: Proportion of time was calculated by dividing total play time with each toy by total time of play session. Significance levels (based on unequal variances) refer to gender differences within age groups. Children commonly played with more than one toy at the same time, therefore proportions do not necessarily add up to (and may exceed) 1.00.

[**] $p < .01$

[*] $p < .05$

Table 4

Mean (SD) Change in Sex-Typed Play from 17 to 21 Months of Children who Did and Did Not Achieve Two Labeling Milestones

Labeling Milestone	Not Achieved	Achieved
Both *boy* and *girl*	.02 (.29)	.19 (.31)
Self-Labeling	.06 (.29)	.26 (.33)

Note: Positive values indicate increases in sex-typed play from 17 to 21 months, values close to 0 indicate no change, and negative values indicate decreases in sex-typed play.