

Preschool Teachers' Facilitation of Gender-Typed and Gender-Neutral Activities during Free Play

Kristen L. Granger¹ · Laura D. Hanish¹ · Olga Kornienko¹ · Robert H. Bradley¹

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Abstract Understanding how preschool teachers facilitate children's engagement in gender-typed and gender-neutral activities is important given that engagement in gender-typed activities is differentially linked to the development of skills connected to later academic achievement. Thus, facilitation of children's engagement in gender-typed activities may contribute to emergence of gender differences in later educational outcomes. The current study used a teacher-focal observational coding system to investigate research questions about the frequency with which teachers facilitated feminine, masculine, and gender-neutral activities with same- and mixed-gender groups during free-play. Participants were 37 female teachers of Head Start classrooms in the U.S. Southwest (M years teaching preschool = 10.57, SD = 6.85, range = 2–27; 75.6 % completed at least a bachelor's degree). Results revealed that feminine activities were facilitated less often than were masculine and gender-neutral activities during free play. Results also revealed variability in teachers' facilitation of feminine, masculine, and gender-neutral activities, depending on the gender composition of the students with whom teachers were interacting (i.e., boys-only, girls-only, and mixed-gender). Implications for educational, developmental, and gender research are discussed.

Keywords Preschool teachers · Classroom behavior · Childhood play behavior · Gender-typing · Human sex differences · Educational toys · Group composition

✉ Kristen L. Granger
Kristen.granger@asu.edu

¹ T. Denny Sanford School of Social and Family Dynamics, Arizona State University, 850 S. Cady Mall, Tempe, AZ 85283, USA

Preschool children spend approximately 30 % of their school day in free play (Chien et al. 2010). During free play, which is a child-directed informal learning environment, teachers allow children to have considerable latitude in choosing activities. In U.S. preschool classrooms, children typically have the opportunity to engage with a variety of academically oriented activities that involve materials such as blocks, dolls, books, bikes, and more during free play (Bredekamp and Copple 1997; Dodge et al. 2002). These activities can be categorized in accordance with preferences typically displayed by boys and girls: Preschool boys often play with materials connected to masculine activities (such as blocks and toys with wheels); girls, with materials connected to feminine activities (such as dolls and clothing). Other materials are gender-neutral and appear to be equally attractive to both boys and girls (e.g., board games, books, clay; for a review, see Ruble et al. 2006).

Children's activity engagement is of concern for teachers, parents, and policymakers because different types of activities provide different types of learning opportunities. For example, research on U.S. children has shown that children who consistently engage in masculine activities, such as building with blocks, are exposed to experiences that are associated with the development of spatial skills—a set of skills that provide a foundation for later math achievement (Ishikawa and Montello 2006; Kersh et al. 2008; Serbin and Connor 1979; Wolfgang et al. 2001). Research is less consistent about the benefits of feminine activities (e.g., dress-up, dolls). However, Miller's (1987) investigation of the cognitive and social benefits of children's play with gender-typed toys suggests engagement in feminine activities encourages more nurturance, creativity, and domestic skills than do masculine activities. Blakemore and Centers (2005) provide more recent support for Miller's findings by also showing that feminine activities are more strongly associated with nurturing skills compared to masculine and neutral activities. Further, Cherney et al. (2003)

showed that preschool children played at more complex levels when engaging in feminine activities compared to masculine and neutral activities, and there is evidence that complexity is connected to more advanced cognitive and social development (Miller and Almon 2009). As such, children's activity experiences in early childhood settings would appear to contribute to the development of differential cognitive and social skills depending on the nature of those experiences. In turn, these skills (and the proclivities connected with them) may help determine gender differences in later educational and social outcomes (Miller 1987; Osborne et al. 2003; Pomerantz et al. 2002).

Considering these findings, it is important to document factors associated with children's gender-typed and gender-neutral activity engagement because this information will highlight how educators might structure children's classroom experiences in ways that optimize children's engagement in a variety of activities. One of the factors to consider is the extent to which teachers' facilitate (e.g., provide explanations, comment on children's behavior, ask questions) children's engagement in activities chosen by the children themselves (such as is typically done during free play) because teachers' facilitation not only supports children's existing interests and skills but also encourages students to acquire new interests and skills (Bodrova and Leong 2003). In this regard, it is important to bear in mind that young girls and boys often choose to play with materials that are associated with their gender (i.e., they engage in "gendered activities"). However, little is known about how often teachers facilitate children's gendered activity engagement. Thus, in the present study, we investigated teachers' facilitation of gender-typed and gender-neutral activities during free play time in U.S. Head Start classrooms aimed for socioeconomically disadvantaged children.

Importantly, we also examined teachers' facilitation of feminine, masculine, and gender-neutral activities with an eye toward examining how the characteristics of a play group (i.e., boys only, girls only, and mixed-gender groups) is associated with variability in teachers' facilitation. Drawing on Ajzen and Fishbein's (1977) attitude-behavior theory, which describes links between environmental factors and human behavior, we hypothesized that teachers vary their facilitation of activities in relation to the immediate context (i.e., gender composition) in which the teacher-child interaction occurs. Thus, we investigated teachers' facilitation of gender-typed activities when interacting with boys-only, girls-only, and mixed-gender groups to increase our understanding of how social contexts may guide teachers' decisions to encourage children's engagement with gendered classroom experiences. All of the cited studies in our literature review are based on U.S. samples unless otherwise specified.

Teachers' Facilitation of Activities

Teachers facilitate children's engagement with activities by modeling behaviors, logical thought, and language; by providing explanations; by commenting on children's behavior; and by asking questions about activities (Ashabi 2007; Trawick-Smith 1998; Trawick-Smith and Dziurgot 2011). No studies, to the best of our knowledge, have examined how preschool teachers facilitate children's engagement in gender-typed and gender-neutral activities. Given this gap and to inform our hypotheses, we consulted literature that addresses a wider range of teacher responses (i.e., reinforcement, praise, punishment, and criticism) to children's play with gender-typed and gender-neutral activities (Fagot and Patterson 1969; Lamb et al. 1980).

There are few, if any, recent studies of teachers' interactions with children in gender-typed and gender-neutral activities. In lieu of contemporary information, we drew on work completed in the 1970s and 1980s. This research suggests that preschool teachers spend more time reinforcing children's play with feminine versus masculine activities (Etaugh et al. 1975; Fagot and Patterson 1969; Lamb et al. 1980; McCandless et al. 1976). For example, using a sample of nursery and kindergarten teachers, Lamb et al. (1980) showed that teachers gave more positive responses (e.g., praise) to children's play with feminine activities than with masculine activities. Although this prior work is focused on teachers' *reinforcement* of children's play, this literature helps guide our predictions of teachers' *facilitation* of children's play by highlighting the types of activities toward which teachers direct their attention and energy. Based on this work, we hypothesized that teachers facilitate feminine activities more than masculine activities. However, we recognize that contemporary teachers may have different priorities than those from the 1970s and 1980's given shifts in preschool practices and a greater focus on getting preschool children ready for formal schooling. Therefore, we consider this hypothesis to be exploratory.

Only one known prior study compared reinforcement of gender-neutral and gender-typed activities, with findings showing that gender-neutral activities were less likely than feminine activities to be reinforced but more likely than masculine activities to be reinforced (Fagot 1985). As noted, this study was conducted 30 years ago. Thus, there is little empirical basis for hypothesizing about facilitation of gender-neutral activities relative to facilitation of feminine and masculine activities. However, we note that there have been significant shifts in preschool practices over the last three decades that place a greater focus on preparing students for formal learning environments (Gronlund 2001). As such, today's teachers are likely to be inclined to facilitate gender-neutral activities more often than gender-typed because gender-neutral activities (e.g. books, language) align more closely with contemporary preschool curriculum. Thus, we expect

that the moderate rates of reinforcement of gender-neutral activities seen three decades ago has likely increased. We hypothesize that teachers facilitate gender-neutral activities more often than either feminine or masculine activities.

Children's Gender and Teachers' Facilitation

Ajzen and Fishbein's attitude-behavior theory (1977) stipulates that human behavior is determined, in part, by factors in the environment. Guided by their theory, we examined a potentially salient preschool environment classroom factor: gender composition. The proportion of girls versus boys in the classroom (or any particular play or work group a teacher encounters at school) is likely to guide teachers' behaviors in the classroom or toward the group because gender is a salient feature of children's identity that is commonly used in teachers' classroom interactions with children (Thorne 1993). For instance, teachers frequently use the phrase "boys and girls" to direct their students, line up students by gender, and create competitions between boys and girls (Lloyd and Duveen 1992; Thorne 1993). Use of gender in this manner has been connected to increases in children's gender stereotypes (Arthur et al. 2008; Bigler et al. 2001). Considering that gender is a salient feature of the classroom that is frequently referenced by teachers, gender composition of groups (i.e., boys only, girls only, mixed-gender groups) may influence the likelihood that a teacher facilitates feminine, masculine, and gender neutral activities during an encounter with students.

Prior work in samples of U.S. preschool children and teachers has shown that teachers' responses to boys' and girls' engagement in gender-typed activities tend to be gender-traditional (Fagot 1984; Lamb et al. 1980; Serbin et al. 1979). For example, Fagot's (1984) observations of children and teachers in play groups revealed that children who chose activities consistent with traditional gender-typed behaviors were given positive feedback: boys for engaging in masculine activities that involved blocks and bikes; girls, for engaging in feminine activities that involved dolls or dress-up. Additionally, in their study of teachers' responses to preschoolers' behavior during free play, Lamb et al. (1980) found that 91 % of teachers' punishments (i.e., criticism, diversion, and disruption) were directed at children's engagement in non-traditional gender activities, with boys receiving higher rates of negative attention from teachers for their engagement in nontraditional gender activities than did girls. However, girls who exhibited cross-gender behaviors only occasionally received negative feedback from teachers. Bredekamp and Copple (1997) echoed these findings, showing 103 early childhood teachers reported being more accepting of girls' cross gender-behaviors and aspirations than of boys'. Taken together, these studies hint that teachers tend to reinforce gender traditional behaviors, particularly for boys.

Interestingly, little is known about teachers' facilitation of gender-neutral activities. One of the few known studies to examine gender-neutral activities found that teachers reinforced gender-neutral activities at similar rates with boys and girls (Fagot 1985). Even less is known about teachers' facilitation of feminine, masculine, and gender-neutral activities with mixed-gender groups. The evidence suggests that children behave differently when they play in mixed-gender groups compared to same-gender groups. For example, children playing in mixed-gender groups tend to play with relatively non-stereotyped neutral activities (Goble et al. 2012). It is possible that teachers notice these differences and facilitate gender-neutral activities at different rates with mixed-gender groups compared to same-gender groups. In regards to masculine activities, Goble et al.' (2012) observations of Head Start children revealed girls played more with masculine activities when with male peers than when playing alone. Thus, it is possible that teachers have increased opportunity to facilitate girl's engagement in masculine activities in the context of mixed-gender groups compared to girls-only groups. In regards to feminine activities, Goble et al. (2012) show boys played more with feminine activities when interacting with the teacher than when playing alone; teachers may try to expose boys to a greater range of experiences in mixed-gender groups than in same-gender groups. Considering that mixed-gender play occurs in 30 % of all interactions children have with their peers (Fabes 1994), understanding how teachers and students interact while in mixed-gender groups and while playing with gender-neutral activities is important.

Present Study

Our goals were to explore how often and with whom teachers facilitated gender-typed and gender-neutral activities in early childhood classrooms. We used observations of teachers' interactions with students from a cross-sectional study of 37 Head Start teachers. Specifically, we examined relations between group gender composition and the likelihood of teachers facilitating masculine, feminine, and gender-neutral behavior in free play. Understanding how often and under what circumstances teachers facilitate gender-typed activities is important because teachers have the ability to influence children's preferences and findings may have implications for teacher practice.

The first goal of the study was to determine if preschool teachers facilitate masculine, feminine, and neutral activities at different rates. Based on previous research, two hypotheses were developed to test this goal:

- Hypothesis 1 Given that neutral activities (i.e., books, math, language) may be more aligned with curriculum requirements compared to masculine (i.e., balls, bikes, large motor) and feminine (i.e., art, dolls,

dress-up) activities, teachers were predicted to facilitate gender-neutral activities more often than masculine or feminine activities.

- Hypothesis 2 Based on research showing that teachers are more likely to reinforce feminine activities than masculine activities at school (Etaugh et al. 1975; Fagot and Patterson 1969; Lamb et al., 1980; McCandless et al. 1976), teachers were expected to facilitate feminine-typed activities more frequently than masculine-typed activities during free play.

The second goal of our study was to explore relations between gender composition of play groups (i.e., groups of only boys, only girls, or mixed-gender groups) and teachers' facilitation of masculine, feminine, and gender-neutral activities. Separate hypotheses were made regarding the possible ways in which teachers may differentially facilitate gender-typed and gender-neutral activities:

- Hypothesis 3 Past work has shown that teachers have a preference for children to engage in gender-typed activities, and this preference appears to be stronger for boys than for girls (Fagot 1977; Fagot and Patterson 1969). Thus, teachers were expected to facilitate feminine-typed activities with girls-only groups significantly more frequently than with boys-only groups or mixed-gender groups.
- Hypothesis 4 Teachers were expected to facilitate feminine activities with mixed-gender groups more often than with boys-only groups because teachers may be more likely to facilitate boys' play with gender atypical activities in the context of gender diverse groups of peers as opposed to same-gender peers so as to expose boys to a broader range of experiences (Goble et al. 2012).
- Hypothesis 5 Teachers were hypothesized to facilitate masculine-typed activities with boys-only significantly more frequently than with girls-only or mixed-gender groups.
- Hypothesis 6 Teachers were expected to facilitate masculine activities with mixed-gender groups more often than with girls-only groups because teachers may have increased opportunity to facilitate girls' play with masculine activities in mixed-gender groups given that girls played more with masculine activities when with male peers than when playing alone (Goble et al. 2012).
- Hypothesis 7 Based on research suggesting that mixed-gender peer groups more often play with relatively non-stereotyped neutral activities

(Goble et al. 2012), teachers were expected to facilitate gender-neutral activities with mixed-gender peer groups significantly more frequently than with girls-only or boys-only groups.

- Hypothesis 8 Based on limited research showing that teachers reinforce gender-neutral activities at similar rates with boys and girls (Fagot 1985), we expected teachers to facilitate gender-neutral activities at similar rates with boys-only and girls-only groups.

Method

Participants

Participants were teachers in Head Start classrooms in an urban U.S. Southwestern city. Head Start supervisors helped arrange in-service meetings at which teachers and researchers discussed the project. The project was introduced as a study of naturally occurring teaching practices and teacher-child interactions. At the conclusion of each meeting, teachers were asked to volunteer as participants. The final sample consisted of 37 female teachers. Teachers were given \$150–\$200 worth of classroom supplies as compensation for their participation. Compensation for teachers varied as a function of the burden they experienced as required by the data collection process. An average of 17 children (range: 15–20) were enrolled in the participating classrooms. Children in the classrooms of participating teachers were largely of low socioeconomic status because the study sample was recruited from Head Start classrooms. Demographic information for teachers and for children across classrooms is presented in Table 1.

Procedures and Measures

Protocol for Observations

Thirty trained undergraduate students functioned as observers of the participating teachers. The students (90 % female) served as classroom coders using a teacher-focal observational protocol. Training was conducted by the lead researcher, with help from graduate research assistants. Undergraduate coders were not informed about the specific goals of the study. Coders completed a total of 20,427 observations of teachers' interactions with children, with an average number of codes obtained per coder of 729.5 ($SD = 529.65$, range was 91–1868). Variability in the number of codes obtained per coder was due to variability among coders in the length of time that they participated in the project and the number of hours per week devoted to the research study. Per university IRB

Table 1 Demographic information for teachers and classrooms

Demographic information	Proportion	Count or <i>M</i> (<i>SD</i>)	Range
Teachers			
Race/Ethnicity			
Hispanic/Latina	43.2 %	16	
White, non-Hispanic/Latina	24.3 %	9	
Black/African American Hispanic/Latina	13.5 %	5	
Hawaiian or Pacific Islander	2.7 %	1	
Other	16.3 %	5	
Highest degree completed			
Bachelor's degree	75.6 %	8	
Two year college	21.6 %	28	
Master's degree	2.7 %	1	
Years teaching preschool		10.57 (6.85)	2–27
Classrooms			
Race/Ethnicity			
White, Hispanic/Latino/a	73 %	12.64 (4.20)	0–19
Black/African American	13.6 %	2.41 (3.75)	0–19
White, not Hispanic/Latino/a	7.2 %	1.23 (1.48)	0–5
American Indian or Alaskan Native	3.8 %	.66 (1.92)	0–11
Hawaiian or Pacific Islander	.5 %	.09 (.28)	0–1
Other	1.35 %	.20 (.58)	0–3
Gender composition: percent of boys	52.3 %	9.05 (2.33)	4–14
Children's age in months across classrooms		46.18–62.30 (9.13–3.04)	36–69

One teacher did not report on her race/ethnicity. Separate data were not provided for boys and girls because teachers did not report on individually identified children but instead reported on the number of boys and girls for each variable

approval, teachers were informed that coders were recording naturally occurring teacher-child interactions but teachers were unaware of the specific teaching practices being observed. Observations took place indoors and outdoors. Although observations occurred throughout the school day, only the observations collected during free play were used for purposes of the present study.

During each observation, trained coders observed the teacher for 10 s, recorded the appropriate codes on a handheld computer, and then began the next 10-s observation. Coders repeated this process for a total of 20 min, took a 5-min break and then began another 20 min of observation. Observations occurred four days a week for 3–4 weeks. For the 37 teachers participating in the present study, on average 552.08 (*SD* = 167.29, range: 318–989) 10-s observations were collected per teacher. Of these observations, an average of 161.85 per teacher (*SD* = 76.22, range: 74–434) were collected during free play.

Reliability data were coded by pairing an undergraduate coder with a reliability coder (i.e., graduate student). During each reliability session, each individual (i.e., the undergraduate coder and the graduate student) independently and simultaneously coded the same teacher's behavior. Reliability observations were conducted on 4081 observations (20 % of the

total number of observations). To control for chance agreement, we used kappas to assess inter-observer agreement. Kappas are calculated by measuring the agreement between the two raters and then subtracting out the agreement due to chance (Martin and Bateson 1993). The average kappa was .86 and the range was .64–.98. A report of inter-coder reliability as well as definitions for each code used is included in Table 2.

Teacher Facilitation of Activities

A teacher's behavior was coded a *facilitation* if the teacher was observed to support or expand on children's engagement in an activity. A teacher would be coded as facilitating if she asked about what children are doing, repeated what a child said, or clarified what children wanted to do (e.g., "Do you need help building this tower of blocks?" or "What are you going to do next with that toy?"). A facilitation code did not include teachers' behaviors that were intended to change (i.e., start or stop) a child's behavior. For the 37 teachers participating in the study, facilitation was coded an average 76 times (*SD* = 43.67, range: 29–235) during free play. Based on 20 % of all observations collected, kappa was .85 for teacher facilitation behavior.

Table 2 Definitions and inter-rater reliabilities for observational data codes

Code	Possible codes	Definition	Kappa
Teacher behavior: Teacher's verbalization directed at the first child during the ten second observation interval	Facilitation	The teacher's main focus was on supporting or expanding child's or children's engagement in an activity.	.85
Gender composition of the groups: To whom teacher clearly directed her verbal or auditory attention	Boy/s	Teacher directed attention toward boy/s (Gender of each child in a group was coded, resulting in a range of kappas for each boy code)	.77–.98
	Girl/s	Teacher directed attention toward girl (Gender of each child in a group was coded, resulting in a range of kappas for each girl code)	.83–.98
Feminine activities	Art	Crayons, paint, stickers	.92
	Pretend role feminine	Nurse, mommy, teacher	.67
	Dress up		.76
	Kitchen materials	Play foods involved	.83
Masculine activities	Balls		.89
	Ride-on toys		.89
	Construction materials		.92
	Computer		.85
	Large motor activities	Running, climbing, swinging, hoola-hoop, sliding	.85
	Pretend role - masculine	Doctor, superhero, fire fighter, chef, policeman	.81
	Trucks, trains, planes, cars, boats		.81
Neutral activities	Board games	Games with rules	.89
	Books/reading		.92
	Clay, play-dough sculpting	Creating with materials	.98
	Digging	Sand-box activities	.86
	Figure play neutral	Fisher Price figures, toy animals	.72
	Language	Spelling, writing, writing names, defining words, labeling emotions	.87
	Math	Shapes, counting	.88
	Music	Singing, musical instruments	.89
	Pretend role - neutral	Animals, monsters	.73
	Sensory play	Anything in sensory table	.64
Clean-up	Toys, objects	.85	

Gender Composition of Recipient(s) of Teacher Facilitation Behavior

Coding the gender composition of students for whom a teacher facilitation behavior applied was determined by counting the number of boys and girls who were the targets of the teacher's visual, verbal, and auditory attention during a facilitation event. Of interest to our study was teachers' facilitation of activities with a single boy, a single girl, a group of boys (ranging from 2 to 5 boys), a group of girls (ranging from 2 to 5 girls), and a mixed-gender group (ranging from 2 to 5 girls and boys). In the present study, we aggregated the codes representing single boys and groups of boys to create a variable representing teachers' facilitation of activities with boys-only (ranging from 1 to 5 boys). We also aggregated the codes of single girls and groups of girls to create a variable representing teachers' facilitation of activities with girls-only (ranging from 1 to 5 girls). We aggregated codes of mixed-

gender groups (ranging from 2 to 5 girls and boys) to create a variable representing teachers' facilitation of activities with mixed-gender groups. Coders also recorded when teachers facilitated activities with large groups (more than 6 children). These codes are not of interest to the present study because the gender composition of large groups was not recorded. Kappas ranged from .82–.90 for all recipient codes.

Measurement of Gender Orientation of Activities

To measure teachers' facilitation of feminine, masculine, and gender-neutral activities, coders recorded the activity referenced or engaged in by the teacher (i.e., what activity the teacher talked about with the children or what activity the teacher and students engaged in). Coders selected from a list of 29 activities, which have been previously categorized as feminine (e.g., dolls, dress-up), masculine (e.g., trucks, bikes), gender-neutral (e.g., books, music), and other (e.g., cleanup,

snack) in prior research (Goble et al. 2012). The activities coded as “other” were not of interest to our study because we were interested in teachers’ facilitation of feminine, masculine, and gender-neutral curricular oriented activities; however, the activities coded as “other” were used in the calculation of proportion scores detailed in the following. The codes in the “other” category included non-curricular activities such as personal care, snack, clean up, and talking. Kappas ranged from .64 to .98 for all activity codes. The categorization of activities by feminine, masculine, and gender-neutral is presented in Table 2.

Construction of Proportion Scores

To address our first goal, proportion scores representing the amount of time teachers spent facilitating feminine, masculine, and gender-neutral activities during free play were calculated by dividing the total number of observations of facilitation of each type of activity by the total number of all observations of teachers’ facilitation. For example, the number of times a teacher facilitated masculine activities in free play was summed and divided by the total number of times that a teacher facilitated activities in free play. It is important to note that proportion score calculations will not sum to 1.0 because activities coded as other were also included in the calculations.

To address our second goal, we created three binary variables for each observation representing teachers’ facilitation of activities: (a) with girls-only, (b) with boys-only, or (c) with mixed-gender groups. Each of these variables was coded as a 0 (indicating no facilitation with that particular gender group) or 1 (indicating facilitation with that particular gender group). Thus, for example, a score of 0 for the variable, Girls-Only, specified that the teacher did not facilitate an activity with girls-only in a specified 10-s observation and a score of 1 specified that the teacher did facilitate an activity with girls-only in that observation. A similar set of binary variables was created for activity type. Each observation was coded as a 0 or 1 for facilitation of Feminine, Masculine, or Gender-Neutral activities (See Table 2 for the list of activities in each category.)

Results

Preliminary analyses were conducted to examine the distribution of characteristics in the data (e.g., descriptive statistics, skew, and kurtosis) with respect to the frequency of time teachers spent facilitating feminine, masculine, and gender-neutral activities. For all variables, skew was less than 2 and kurtosis was less than 7, suggesting all study variables were normally distributed and no transformations were necessary (Tabachnick and Fidell 2007).

Preliminary analyses were also conducted to identify possible control variables. Pearson product moment correlations were conducted to examine whether the proportion of time teachers spent facilitating feminine, masculine, and neutral activities was related to teachers’ education, years of teaching experiences, and the gender composition of the classroom. Results revealed no significant associations between teachers’ education, years of teaching experience, and the outcome variables. However, the proportion of boys in a class was positively related to the proportion of time teachers spent facilitating masculine activities, $r = .39$, $p = .017$. Therefore, the classroom gender composition, operationalized as the proportion of boys in the classroom, was included as a control variable in all of the following analyses.

Frequency of Teachers’ Facilitation

The first goal of our study was to examine differences in how often teachers facilitated feminine, masculine, and gender-neutral activities. Our first hypothesis (Hypothesis 1) was that teachers facilitate gender-neutral activities more often than masculine or feminine activities. Our second hypothesis (Hypothesis 2) was that teachers facilitate feminine-typed activities significantly more frequently than masculine-typed activities. To formally test Hypotheses 1 and 2, a repeated measures ANOVA, controlling for classroom gender composition and with one within-subject factor (activity type), was conducted. Results indicated a marginal main effect for activity, $F(2,70) = 3.03$, $p = .055$, $\eta^2 = 31\%$. This trend level effect was followed up using Tukey’s post-hoc tests. Results partially supported the hypothesis that teachers facilitate gender neutral activities more often than masculine or feminine activities. That is, teachers facilitated gender-neutral ($M = .28$, $SD = .14$) activities more often than feminine ($M = .15$, $SD = .12$) activities, $p = .001$, but no significant difference emerged between teachers’ facilitation of gender-neutral and masculine ($M = .25$, $SD = .13$) activities. Results did not support the hypothesis that teachers facilitate feminine-typed activities more often than masculine-typed activities. Instead the opposite was found, teachers facilitated masculine activities more than feminine activities, $p = .005$.

Children’s Gender and Teachers’ Facilitation

The second goal of our study was to examine how the gender composition of groups influenced teachers’ facilitation of feminine, masculine, and gender-neutral activities in free play. We proposed six different hypotheses to test the many ways in which teachers’ facilitation may have differed across group gender composition. In regards to feminine activities, we expected that teachers facilitate feminine-typed activities with girls-only groups significantly more frequently than with boys-only groups or mixed-gender groups (Hypothesis 3).

We also expected that teachers facilitate feminine activities with mixed-gender groups more often than with boys-only groups (Hypothesis 4). In regards to masculine activities, we expected that teachers facilitate masculine-typed activities with boys-only significantly more frequently than with girls-only or mixed-gender groups (Hypothesis 5). We also expected that teachers facilitate masculine activities with mixed-gender groups more often than with girls-only groups (Hypothesis 6). Finally, in regards to gender-neutral activities, teachers were expected to facilitate gender-neutral activities with mixed-gender peer groups significantly more frequently than with girls-only or boys-only groups (Hypothesis 7) and they were expected to facilitate gender-neutral activities at similar rates with boys-only and girls-only groups (Hypothesis 8).

To test Hypotheses 3–8, which all pertain to examining playgroup gender differences in teachers' facilitation of feminine, masculine, and gender-neutral activities, we used generalized estimating equations (GEEs). GEEs, which involve aggregating across many observations to represent each individual's average behavioral tendencies, are preferable to traditional methods for analyzing observational data for three reasons. First, GEEs allow for analysis at the observation level rather than at the level of the individual by accounting for the interdependence among the observations by teacher (Liang and Zeger 1986). Additionally, GEE methods do not make assumptions about the distribution of the dependent variables, allowing each teacher to have a different number of observations. Finally, we were interested in the gender composition of groups of children, which could not be meaningfully aggregated at a teacher level because these are specific to each peer group in an observation.

To test Hypotheses 3–8, we set up models in which the gender-oriented activity type (i.e., feminine, masculine, or neutral) served as the dependent variable and the gender composition of the play group (i.e., boys-only, girls-only, mixed-gender groups) served as the independent variable. Two sets of models were run for each dependent variable (i.e., gender-oriented activity type). In the first model, mixed-gender groups served as the reference group, and in the second model, girls-only served

as the reference group. We used reference groups in this manner to compare each type of gender group to the other two. Because these models are akin to logistic regression procedures with dummy coded predictor variables, they do not yield an overall effect for the categorical predictors (Liang and Zeger 1986). In all models, the gender composition of the classroom was included as a covariate. This modeling strategy was the same for each of the three dependent variables, resulting in a total of six models. To interpret findings we present the Odds Ratio (OR) for type of gender grouping analyzed. OR is an effect size used to examine the degree of association between two binary variables. To ease interpretability, we also calculate and present the equivalent probability ($p = OR/(1 + OR)$), which represents the percent increase in the odds of facilitation occurring (Hosmer and Lemeshow 1989).

In formally testing Hypotheses 3 and 4, which are about group-gender differences in facilitation of feminine activities, results confirmed our hypotheses showing teachers were more likely to facilitate feminine activities with girls-only compared to boys-only groups (Odds Ratio = .59, equivalent probability = 37 %) and teachers were more likely to facilitate feminine activities with mixed-gender groups compared to boys-only groups (Odds Ratio = .63, equivalent probability = 39 %, see Tables 3 and 4).

To test Hypotheses 5 and 6, which address group-gender differences in facilitation of masculine activities, results confirmed our hypotheses by revealing that teachers were more likely to facilitate masculine activities with boys-only compared to girls-only groups (Odds Ratio = 1.31, equivalent probability = 57 %) and teachers were more likely to facilitate masculine activities with mixed-gender groups compared to girls-only groups (Odds Ratio = .67, equivalent probability = 40 %, see Tables 3 and 4).

Finally, to formally test Hypotheses 7 and 8, which are about group-gender differences in facilitation of gender-neutral activities, results confirmed our hypotheses showing that teachers facilitate gender-neutral activities with mixed-gender groups more often than with boys-only groups (Odds Ratio = .59, equivalent probability = 37 %) and more often

Table 3 Gender composition of group with whom teachers interacted as a predictor of teachers' facilitation of gender typed activities with mixed-gender as the reference group

	Masculine			Feminine			Neutral		
	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio
Intercept	-1.90***	.42	.15	-1.50*	.601	.22	-.36	.46	.69
Proportion of boys	1.72*	.75	5.59	-.366	1.11	.69	-.64	.84	.52
Boys-only	.10	.10	1.1	-.464*	.14	.63	-.52***	.11	.59
Girls-only	-.40***	.11	.67	.143	.12	1.15	-.28**	.10	.75

Mixed-gender is the reference. B is interpreted in log odds units. Degrees of freedom for all comparisons is 1

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 4 Gender composition of group with whom teachers interacted as a predictor of teachers' facilitation of gender typed activities with girls-only as the reference group

	Masculine			Feminine			Neutral		
	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio
Intercept	-2.25 ^{***}	.42	.105	-1.40 [*]	.60	.25	-.49	.45	.60
Proportion boys	2.05 ^{**}	.75	7.78	-.43	1.12	.65	-.62	.85	.53
Boys-only	.24 ^{**}	.10	1.31	-.53 ^{***}	.14	.59	-.41 ^{***}	.10	.66
Mixed-gender	.12	.22	1.29	.037	.26	1.03	-.14	.21	.86

Girls-only is the reference. B is interpreted in log odds units. Degrees of freedom for all comparisons is 1

* $p < .05$. ** $p < .01$. *** $p < .001$

than with girls-only groups (Odds Ratio = .75, equivalent probability = 43 %). However, results did not confirm our hypothesis that teachers would facilitate gender-neutral activities at similar rates with boys and girls. Instead results revealed teachers facilitated neutral activities with girls-only groups more often than with boys-only groups (Odds Ratio = .66, equivalent probability = 40 %; see Tables 3 and 4).

Discussion

In the present study, we examined preschool teachers' tendency to facilitate feminine, masculine, and gender-neutral activities with their students. In addition, we examined the patterns of these gender-oriented behaviors with respect to the gender composition of the recipient group (i.e., boys-only, girls-only, and mixed-gender groups). Results partially supported hypotheses about teachers' overall tendencies to facilitate gender-neutral, feminine, and masculine activities by revealing that teachers facilitated gender-neutral activities more often than feminine activities, but not more often than masculine activities. However, the expected finding of facilitation of greater feminine activities relative to masculine activities was not supported. Instead, teachers facilitated masculine activities more often than feminine. Additionally, findings supported the expectation that teachers would vary their facilitation of feminine, masculine, and gender-neutral activities based on the gender composition of a group. These findings are consistent with Ajzen and Fishbein's (1977) attitude-behavior theory in that they suggest that teachers alter their facilitation of gender-typed activities in response to factors (i.e., gender composition of groups) in the environment.

Frequency of Teachers' Facilitation

The first goal of our study was to assess the extent to which contemporary teachers facilitated masculine, feminine, and gender-neutral activities in their classrooms during free play.

Teachers were hypothesized to facilitate gender-neutral activities more often than masculine or feminine activities (Hypothesis 1) because gender-neutral activities may be more aligned with curriculum requirements compared to masculine and feminine activities. Results partially supported this hypothesis, revealing that teachers facilitated gender-neutral activities more often than feminine activities. But, a significant difference did not emerge between teachers' facilitation of gender-neutral and masculine activities. Teachers were also hypothesized to facilitate feminine-typed activities more frequently than masculine-typed activities (Hypothesis 2), based on prior research that shows teachers spend more time engaged in feminine activities (Fagot and Patterson 1969). Results revealed teachers facilitated masculine activities more often than feminine activities, contradicting our initial hypothesis (Hypothesis 2).

Overall, the present findings show a clear lack of preferential facilitation of feminine activities. That is, both gender-neutral and masculine activities were facilitated more often than feminine activities. These findings diverge from findings reported for studies carried out in the 1960s and 1970s, which demonstrate teachers' preference for facilitating feminine activities (Fagot and Patterson 1969; Lamb et al. 1980). This apparent historic shift in teachers' practices regarding feminine activities may reflect an evolution in thinking about what is gender-appropriate for boys and girls and in changing curriculum and educational expectations for preschoolers (Basow 2010). That is, contemporary teachers may view feminine activities (e.g., kitchen, dolls) to have little positive educational effects compared to masculine (e.g., block play) or gender-neutral (e.g., books) activities and as a result may be less likely to facilitate feminine activities.

Moreover, findings from the current study show a preferential facilitation of gender-neutral activities over feminine activities. This finding may also be explained by recent changes in U.S. educational policies resulting from the need to meet recommended academic guidelines. Preschool has become the new home for foundational pre-academic learning and the development of a positive orientation toward learning

activities (Miller and Almon 2009). This is reflected in Head Start's framework (Office of Head Start 2010), with an increased emphasis on getting children ready for kindergarten as contrasted to the emphasis on just getting children comfortable with school settings. As such, there is greater pressure on preschool teachers to ensure that classroom environments are conducive to formal learning (National Association for the Education of Young Children 2015). The nature of the activities categorized as gender-neutral includes those intended to directly promote children's academic skills (i.e., math, books, language). Thus, teachers may be inclined to facilitate gender-neutral activities among both girls and boys to promote children's engagement in activities that directly encourage reading, writing, and critical thinking skills.

Teacher's preference to facilitate gender-neutral activities over feminine activities may also be due to teachers' efforts to prevent gender stereotyping from occurring in the classroom.

Head Start encourages all teachers, staff, consultants, and volunteers to refrain from stereotyping on the basis of gender to promote the unique identity of each child. Head Start suggests that one way teachers can prevent gender stereotyping in the classroom is to provide play materials that reflect a range of diverse gender roles (Office of Head Start 2012). This contemporary view on gender in the classroom may prompt teachers to facilitate gender-neutral activities more than feminine activities in efforts to prevent gender stereotyping.

It is noteworthy that masculine activities were facilitated at rates that were similar to gender-neutral activities but greater than feminine activities. One educationally salient way in which masculine activities differ from feminine is in the extent to which they tend to be more active, rough-and-tumble, and potentially disruptive to an academic learning environment (Fabes et al. 2003; Fagot 1977). It is possible that during free play teachers may be inclined to facilitate children's engagement in masculine activities (e.g., rough and tumble play) as means of recognizing children's needs for physical movement and in order to prepare children for the next structured learning activity. Additionally, while children are engaged in masculine activities, contemporary teachers may feel the need to be more hands-on in managing children's engagement in these (i.e., commenting on children's behaviors, asking questions about the activity, modeling behaviors when children are involved in bikes or playing basketball). This may be because teachers are concerned about classroom management and children's safety; facilitating masculine activities may help to ensure safe classroom environments during free play (Emmer and Stough 2001).

Children's Gender and Teachers' Facilitation

The second goal of our study was to examine the extent to which teachers facilitated feminine, masculine, and neutral activities with boys-only, girls-only, and mixed-gender

groups. In regards to feminine activities, we expected teachers would facilitate feminine-typed activities with girls-only groups significantly more frequently than with boys-only groups or mixed-gender groups because prior work has shown that teachers have a preference for children to engage in gender-typed activities (Fagot 1977; Fagot and Patterson 1969; Hypothesis 3). We also expected that teachers would facilitate feminine activities with mixed-gender groups more often than with boys-only groups (Hypothesis 4) because teachers may be more likely to facilitate boys' play with gender-atypical activities if it is in the contexts of gender diverse groups of peers as opposed to same-gender peers. Results confirmed our hypotheses, showing that the odds of a teacher facilitating a feminine activity with girls-only groups was 37 % higher than with boys-only groups and that the odds of a teacher facilitating a feminine activity with mixed-gender groups were 39 % higher than with boys-only groups.

In regards to masculine activities, teachers were hypothesized to facilitate masculine-typed activities with boys-only groups significantly more frequently than with girls-only and mixed-gender groups (Hypothesis 5), and they were expected to facilitate masculine activities with mixed-gender groups more often than with girls-only groups (Hypothesis 6). Results confirmed our hypotheses. Specifically, our findings showed that the odds of a teacher facilitating a masculine activity during encounters with boys-only groups during free play was 57 % higher than the odds during encounters with girls-only groups. Likewise, the odds of a teacher facilitating a masculine activity with mixed-gender groups were 40 % higher than with girls-only groups.

The present findings show that teachers' facilitation of gender-typed activities appears to be gender-typical. Additionally, results revealed there was relatively little facilitation of activities typical of the other gender unless children were in groups with members of the other gender (i.e., in mixed-gender groups). These findings lend further support to previous work demonstrating teachers' gender-traditional reinforcing and punishing responses to boys' and girls' engagement in gender-typed activities (Fagot 1977, 1984; Lamb et al. 1980; Serbin et al. 1979). When facilitating activities in gender-traditional ways, it is possible that teachers are simply responding to children's activity preferences, and as such are encouraging children's self-directed, autonomous activity engagement (Skager 2014). However, by acceding to children's activity preferences, teachers may be missing opportunities to broaden children's interests and skills through engagement in diverse activities (Lynch 2016)

Turning to a discussion of gender-neutral activities, we hypothesized that teachers would facilitate gender-neutral activities with mixed-gender peer groups significantly more frequently than with girls-only or boys-only groups, based on research suggesting that mixed-gender peer groups play with relatively non-stereotyped neutral activities (Goble et al. 2012:

Hypothesis 7). We also expected that teachers would facilitate gender-neutral activities at similar rates with boys-only and girls-only groups based on limited research showing that teachers reinforce gender-neutral activities at similar rates with boys and girls (Fagot 1985; Hypothesis 8). Results confirmed Hypothesis 7 showing that teachers facilitated gender-neutral activities with mixed-gender groups more often than with boys-only groups (odds increase was 37 %) and more often than with girls-only groups (odds increase was 43 %). However, Hypothesis 8 was contradicted by results showing that teachers facilitated gender-neutral activities with girls-only groups more than with boys-only groups (odds increase was 40 %). Although this finding is surprising, prior work demonstrates that girls' have a preference to engage in pre-academic activities and that teachers spend more time with children who are engaged in academic behaviors (Fagot et al. 2000). Thus, it is possible teachers facilitate academically oriented gender-neutral activities with girls-only groups more than with boys-only groups in response to girls' preferences.

Strengths and Limitations

A major strength of the present study pertains to the use of naturalistic observational methods. No studies, to the best of our knowledge, have employed the use of a teacher-focal coding system. The majority of observational studies on teacher-student interactions have used child-focused scan observations, in which coders rotate observations on each child in the classroom (Rudasill 2011; Booren et al. 2012), or have focused on the classroom as a whole (Pianta et al. 2008). Although child scan data provide important information at the child level and classroom observational data provide important information about the entire context, both of these methods preclude assessment of the frequency and quality of teachers' interactions with students. By employing a teacher-focused observational coding system, the current data capture teacher-child interactions from the perspective of a teacher (compared to child-focused or global classroom-level assessments) and more accurately reflect the amount of time teachers spend interacting with students.

Although the present study fills gaps in the literature, it also has some limitations. Our study focused on a single class of teaching behavior. We suggest further research should include a broader range of teachers' behaviors including praise and punishment. As with teachers' facilitation, there is likely variability in the extent to which teachers employ these behaviors when children interact with gender-typed and gender-neutral activities. Examining these teacher behaviors together will provide a comprehensive description of how teachers interact with boys and girls in the classroom and shape the gendered classroom environment.

One way in which the present study contributes to the literature is by raising new questions for future research to address. We have suggested that teachers' facilitation behaviors might be determined by both their own preferences for promoting particular types of activities and by their desires to support and encourage children's pre-existing interests. Findings may also reflect the relative costs of facilitating certain types of activities relative to others. To illustrate, some activities, such as large motor activities, may require more energy from a teacher to facilitate. Thus, teachers' perceptions of the costs of facilitating particular activities may affect their behavior. It is also important to note that our findings may reflect differences in opportunities for teachers to facilitate each activity. Indeed, it is possible that masculine, feminine, and neutral activities occur at different frequencies in the classroom, perhaps because of the relative accessibility of materials or because of children's preferences for engagement in these activities. Thus, the present findings may reflect the probability of a behavior occurring. Because of the limitations of the present data, we were not able to address these issues in the depth needed. However, each of these factors deserves greater scrutiny in future research by including parameters to control for activity base rates and by including variables to assess the relative contribution of teacher-level and child-level predictors of facilitation.

Further, the present findings should be interpreted in light of methodological factors. To illustrate, an unequal number of activities were assigned to each category: four for feminine, seven for masculine, and 11 for neutral, which may limit a teacher's chance of being observed to facilitate each activity type. And, the activities assigned to each category in the present study do not completely overlap with those assigned to each category in prior studies (Fagot 1985; Lamb et al. 1980). Although in the masculine category there is large overlap between assigned activities, there is a smaller amount of overlap for feminine and neutral activities (for example, Lamb and colleagues, 1980, categorized reading, sewing, and music as feminine whereas the present study does not). Thus, differences in findings between the present study and earlier work may be due to activity categorization. However, it is also possible that discrepancies in activity categorization may not be different enough to change the overall conceptualization of feminine, masculine, and neutral activities from study to study. Given that the present study categorized activities based on a recent assessment of boys' and girls' preferences, findings should be interpreted as a contemporary picture of feminine, masculine, and gender-neutral activities (Goble et al. 2012). Further, the 10-s coding time for observations may influence findings. Because coders recorded 10-s codes consecutively it is possible longer activities are given more weight in the present study (because they may be coded for more 10-s observations than shorter activities). Overall, these methodological factors may bias the results. To address these issues in

future work, an equal number of activities should be assigned to each category and the probability of an activity's occurrence should be weighted to equate teachers' opportunities to engage in each activity.

Additionally, the nature of our sample (female Head Start teachers) limits the generalizability of the findings. Future work would benefit from examining teachers' facilitation of gender-typed activities across a range of classroom types (i.e., Head Start, private, public), with both male and female teachers. Future work would also benefit from testing the proposed hypotheses in various cultural contexts because it is possible the present findings, from a Western sample of teachers, may not replicate across cultural contexts. For example, Fagot (1977) found different patterns in teachers' reinforcement of boys' and girls' gender-typed behaviors across Dutch and U.S. teachers. Fagot hypothesized that this difference may be due, in part, to perceived norms for boys' and girls' behaviors.

Conclusion

The extent to which teachers facilitate gender-typed and gender-neutral activities appears to be constrained by the gender composition of the student groups with whom they interact (i.e., boys-only, girls-only, and mixed-gender groups). These findings provide a contemporary picture of how teachers facilitate gender-typed activities and hint that there have been changes over time in preschool teachers' approach to gender in the classroom. For instance, the explicit goal of making Head Start classrooms more gender-accepting is partially manifested in teachers' overall preference for gender-neutral activities. However, it appears gender-typing in teachers' facilitation of activities with boys, girls, and mixed-gender groups is still occurring in contemporary preschool classrooms. Researchers, educators, and policymakers can use this information to inform teachers about tendencies for gender-biased teaching practices during free play. Informing teachers about this trend may prompt teachers to reflect on their own teaching practices and serve as a catalyst for the promotion of teaching practices that create classroom environments in which boys and girls receive support for engagement with a variety of classroom activities.

Compliance with Ethical Standards This is original research not under consideration for publication elsewhere. No copyrighted material has been used. All of the listed authors made substantial contributions to this research and have agreed upon the listed order for authorship. None of the authors had any conflicts of interest while conducting and reporting this research. Funding sources were the T. Denny Sanford School of Social and Family Dynamics and the Challenged Child Project. We have complied with all APA ethical standards in the recruitment and treatment of our participants and conducted this research under the supervision of the Arizona State University's Institutional Review Board.

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