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THE EFFECT OF PLAY WITH HIGHLY FEMINIZED TOYS ON PRESCHOOL

GIRLS' ATTITUDES ABOUT GENDER NONTRADITIONAL CAREERS

A Thesis in

Psychology

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ABSTRACT

One road to the development of girls' interests in future occupations is through play. The current study tested whether 46 girls (48-69 months old, mean = 57) participating in an occupational computer game would increase in their interest in traditionally masculine jobs depending on the degree to which the game's primary character was culturally feminized. Specifically, the game presented masculine, feminine, and novel occupations depicted either by Barbie or by a less feminized Playmobil character. Dependent measures assessed girls' interest in masculine and feminine activities, interest in masculine and feminine jobs, and interest in game-depicted jobs. The study also examined whether the impact of the game would vary in relation to individual differences in the degree to which gender is personally salient (Liben & Bigler's gender salience filter, GSF; 2002). Girls were given three GSF measures: (a) gender typicality, (b) own-sex affiliation, and (c) own-sex memory, which combined to create a GSF score. Findings showed that the Playmobil game had little impact on girls' interests, irrespective of individual differences in GSF. In contrast, the Barbie game had significant effects, in conjunction with GSF differences. For girls with a stronger GSF, playing the Barbie game led to an increased interest in feminine activities. Additionally, girls with a stronger GSF also showed less interest in the game-depicted masculine jobs if they had played the Barbie version. These results have implications for interventions which seek to build on some girls' feminized interests as a way to foster interests in nontraditional domains. These results also underscore the value of assessing GSF level, since outcomes may vary accordingly.

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Chapter 1. INTRODUCTION

Some children's toys are especially culturally iconic. These toys (e.g., Barbie, G. I. Joe) are easily recognizable to most Americans and represent a type of "classic" American womanhood or manhood. Such toys also remain extremely popular over historical time. Iconic toys carry with them important information about what it is to be a member of various social groups such as those defined by gender, race and ethnicity, sexual orientation, and others. These toys may serve as particularly important sociocognitive models because of the social group information they carry. Barbie, an example of a culturally iconic toy and the focus of the current study, may be a salient model of femininity. Because Barbie is a highly-promoted example of American womanhood as a classic toy, girls may look to her for information about being female. Suggestive of Barbie's importance in American culture, each American girl owns, on average, eight Barbie dolls (Turkel, 1998). The present study seeks to test whether Barbie, as an iconic, feminized toy, in comparison to a less feminized, less iconic toy, can be a particularly powerful vehicle for conveying counter-stereotyped messages in order to change girls' attitudes about careers and gender traditionality. The potential effect of play with iconic, feminized toys on gender development can be understood in the context of gender schema theory (Martin & Halverson, 1981) and social learning theory (Bussey & Bandura, 1999).

Gender Development: Schema, Personal Pathway, and Social Cognitive Theories

According to gender schema theory (Martin & Halverson, 1981), children process gender-relevant information schematically. They approach what they categorize as being for their own gender and avoid what they categorize as being for the other gender. Thus, boys and girls are motivated to develop gender-consistent skills and end up avoiding opportunities by which they would develop gender nontraditional skills. For example, girls may approach what

they have categorized as toys culturally defined as for girls and avoid those defined as for boys, learning the skills imparted by the girl toys and missing the opportunity to learn from the boy toys; the same is true in reverse for boys. Gender-linked information comes from models in the immediate environment as well as from iconic individuals and the media, and contributes to the development of children's gender schemas. Barbie may be one such source of gender-linked knowledge.

In a modification and extension of gender schema theory, Liben and Bigler (2002) suggested two pathways of gender development and highlighted the importance of individual differences in the emergence of gender-related attitudes and personal interests and behaviors. According to this dual-pathway approach, the child's own interest and the degree to which gender is personally salient both affect the relationship between a gender-linked encounter and the resulting gender attitude change or confirmation. Children's own characteristics and interests drive the effect of a gender-linked encounter on gender attitudes.

According to the attitudinal pathway, a child is confronted with an encounter and then proceeds based on the degree to which gender is personally salient. For high gender salience filter children, they may apply their existing knowledge of schemata to the situation to decide whether to engage or avoid. If they deem the encounter gender-appropriate, they will still only engage if they are interested. For low gender salience filter children, they may still engage if the encounter is of personal interest but it may not activate existing schemas. Co-occurring with the attitudinal pathway is the personal pathway (see Figure 1). In this model, children engage only with encounters that are of personal interest, and revise gender schemas only in the event that gender is highly salient for them so they are actively looking for gender information. For children not interested by something, no engagement occurs. For children for whom gender is

not highly salient, encounters are not likely to affect gender schemas. Thus, for a toy like Barbie, girls will use Barbie's gender information to inform their own gender development only if they perceive the toy as interesting and if gender is salient for them. The present study will test the impact of the gender salience filter of the personal pathway model (see Figure 1).

Gender typicality is an important facet of gender salience and attention to gender. Gender typicality refers to the extent to which a child perceives him or herself as being similar to other boys or girls. It follows that girls who perceive themselves as being much like other girls will also be more interested in those things culturally defined as "for girls" and perhaps less so than in what is defined as "for boys." However, a girl might instead perceive herself as less similar to other girls and maybe more similar to other boys in terms of interests, competencies, or other points of comparison. For that girl, the personal pathway model would predict that she might not engage in a girl-typed gender encounter because she does not categorize herself in that way. Martin, Fabes, Hanish, Leonard, and Dinella (2011) also showed that perceived similarity was an important predictor of the gender makeup of a child's play group. Martin and colleagues gave children a novel toy and asked for the child's own interest in the toy and their expectations about an own-sex and other-sex peer's interest in that toy. They interpreted those interest ratings as an implicit measure of perceived similarity. Girls who perceived themselves as being more similar to boys also played less with boys and more with girls. Thus perceived typicality is an important facet of understanding the self-relevance of gender-linked encounters and their consequent effects on gender schemas and behavior.

Social learning theory, too, addresses how gendered, iconic toys can impact gender development. According to social learning theory, children learn how to behave as a member of their gender group by observing and copying personally-salient models and through direct

reward and punishment for gendered behavior (Bussey & Bandura, 1999). Boys and girls attend to different models and are differentially sanctioned for the same behaviors, thus gender differentiation quickly emerges. Because boys and girls end up engaging in different activities, they build self-efficacy in somewhat different domains. This may enhance gender differences in behavior, preferences, activities, and occupational aspirations (Bussey & Bandura, 1999). If girls model the feminine Barbie and her activities, they will build efficacy in those traditionally feminine domains to the exclusion of other domains.

Considering these theories together in the context of children's development of career interests, it would be expected that girls would aspire to traditionally feminine jobs and boys to traditionally masculine jobs. This association would be particularly strong for those children for whom gender is salient. That is, girls are attending to female-linked messages and building efficacy in those domains while boys attend to male-linked messages and build efficacy in male domains. Thus, children may be dismissing or ignoring potential career avenues at a young age simply because those jobs are not traditionally consistent with their own gender. Although as adults, individuals may pursue jobs that differ from those that they aspired to as children, these early aspirations can be indicative of domains in which they develop efficacy. Indeed, there is evidence that career aspirations are determined more strongly by self-efficacy rather than actual achievement (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Fulcher, 2011). If a preschool boy aspires to be a nurse, that may reflect the relative absence of imposed gender restrictions as compared to when a boy aspires to be a doctor. Davey and Stoppard (1993) found that girls report desiring less gender traditional jobs than they actually expected to hold; this may indicate that they may lack a feeling of efficacy in those less traditional domains.

Make-Believe Play and Culturally Iconic Toys

Play is one important arena in which children learn about gender. Toys provide a wealth of gender-relevant information. Likewise, children typically play in sex-segregated groups (e.g., Maccoby, 1998). Children rehearse behaviors with toys and boys and girls engage with different, gender-appropriate toys, thereby developing self-efficacy in different domains. Given the prevalence of play in young childhood, it may be possible to use toys as a vehicle to change sex-typing. In one study using a related approach, Green, Bigler, and Catherwood (2004) exposed a sample of preschoolers selected for their high degree of gender-typed play to books that carried a counterstereotypic message. In these books, a main character played with a culturally cross-gender toy and received encouragement from own-sex peers, parents, and teachers. Girls who heard the counterstereotypic books played more with masculine toys than did girls who heard a neutral book that contained no gender information. These findings suggest that the books were an effective tool for changing girls' gender-typed toy play. Interestingly, no such change was observed among the boys in the study who continued to play predominantly with masculine toys regardless of the books they were read. It may also be possible to use toys directly as vehicles for teaching counterstereotypic messages about gender. The present study seeks to examine that possibility.

Some toys, like Barbie, are particularly well-defined in terms of the social group information they convey. Barbie, for example, is defined by the hundreds of activities in which she has been portrayed as engaging, as well as by the scripts that she enacts in movies and books. The more highly defined a toy, the more it may contribute to schema development because it offers more highly relevant information about social groups. Barbie is defined by her existing roles and appearance, but she is equally defined by what she is not, or never has been. Barbie

dolls model culturally traditional feminine behaviors and ideals of female appearance. The line of Barbie career dolls in particular may circumscribe the kinds of jobs girls consider for themselves. If the career Barbie that is available is Babysitter Barbie and not Firefighter Barbie, this may send the message that being a childcare provider is more desirable for girls than being a firefighter. Thus toys can be models themselves and can convey information about gender beyond how children of a particular gender should play. They can be catalysts for the rehearsal of behaviors and social interactions with parents and peers, thus contributing to gender-relevant schemas.

In addition to the gender-linked information that comes with a particular toy, the mode of toy play also has implications for development. One prevalent mode of play for young children, and the mode commonly used with dolls, is make-believe play. In early childhood, boys engage in more fantasy and aggressive pretend play while girls engage in doll play as their pretend play (Case-Smith & Kuhaneck, 2008). That is, girls especially use dolls in the context of pretend play. Engaging in pretend play facilitates language development, theory of mind development, and perspective-taking ability (Nielsen & Christie, 2008). In a study of make-believe play within own-sex preschool friendship groups, Kyratzis (1999) found that girls, especially, use make-believe narrative play to explore possible selves. Children first engage in pretend play with adults who model pretense. Thus, adults constitute an integral source of information not only about how to engage in make-believe play, but importantly, about what can be pretended or imagined in the first place.

Girls and Barbie

Barbie may be the ultimate example of an exceptionally popular, culturally iconic toy. Barbie is generally marketed in a traditionally gender typical manner in terms of her dress,

activities, and the box in which she is packaged. The line of career Barbie dolls overwhelmingly portrays traditionally feminine, rather than masculine, careers. Although career dolls are only one of many lines of Barbie dolls, career play may be important in shaping children's ideas about and interest in future work life. Kuther and McDonald (2004) offered qualitative data about the play themes that 10 to 12-year-old girls retrospectively reported engaging in with their Barbie dolls. Many girls spoke of enacting very feminine or sexualized scripts. However, the attitude that Barbie can do anything was a theme that influenced girls' beliefs about Barbie and careers; girls also reported playing with Barbie in her career roles in addition to the feminine scripts that characterized the majority of their play. Therefore, it is important to look quantitatively at the effect that career Barbies have on girls' aspirations.

In their classic work, Bussey and Bandura (1984) tested the influence of social power on the appeal of social cognitive models. Own-sex models were most appealing to preschool-age children. However, when shown either a video of men in power and women in a subordinate position, or the reverse (women in power and men in a subordinate position), they found that children were especially drawn to powerful own-sex models. This finding suggests that for girls, the potential impact of Barbie in a high power, gender nontraditional career role would be especially strong. Certainly, some work with adolescent girls suggests that female role models may be an effective intervention in increasing girls' gender nontraditional interests. Weisgram and Bigler (2006) evaluated the effectiveness of a national program, Expanding Your Horizons, in increasing girls' interest in science. The program was a one-day conference where girls engaged in activities and heard about careers in science from female scientists. Some girls also heard female scientists discuss the altruistic nature of their work. Weisgram and Bigler found that girls who participated in the conference increased in their self-efficacy for and interest in

science. However, they found less support for the effectiveness of emphasizing a traditionally female value, altruism, in scientific careers on girls' interest in science. Moreover, work with young adults suggests that indulging some gender stereotypic beliefs among gender-identified women can be highly effective in changing their attitudes about other gender stereotypes. Miyake and colleagues (2010) found that women for whom gender was a salient part of their identity improved more in their physics test scores after an identity-affirming intervention than did women for whom gender was not a salient part of their identity. This suggests that in the domain of toys, Barbie or other highly feminized toys might be especially influential for highly gender-identified girls.

The persuasion literature, too, suggest that, career play with Barbie may be particularly influential in shaping girls' attitudes and career aspirations. Although the classic persuasion theories do not address the process of persuasion in children (e.g., Elaboration Likelihood Model, Petty & Cacioppo, 1986; Heuristic Systematic Model, Eagly & Chaiken, 1993), some researchers have sought to connect these theories of the persuasion process with changes in cognitive development over childhood (e.g., Buijzen, Van Reijmersdal, & Owen, 2010). Buijzen and colleagues describe a triple level model of media persuasion in a developmental context, integrating multiple theories about persuasion that occur at different levels of attention.

According to Buijzen and colleagues (2010), systematic persuasion processing occurs when one deliberately thinks about and cognitively elaborates on a message. This happens when one attends to a particular message and thinks about its meaning and implications. Children may be less likely to engage in this process with some forms of advertising, but they may process at this level during extended play with branded toys. Heuristic persuasion processing involves moderate attention to persuasive messages, guided by heuristic cues like attractiveness. Such

processing would occur under conditions in which one observes a message with less critical attention and instead responds to other cues in the message. Certainly, Barbie's messages might be persuasive at this level given her traditionally feminine beauty and bright pink packaging. Finally, automatic persuasion processing occurs when there is little attention to a message, so opinion is guided by affective response. A funny commercial might prompt this kind of thinking; viewers may laugh and enjoy themselves and in turn, feel positively toward the product. Play is fun, so play with Barbie might promote positive affect and in turn, attention to Barbie and her activities.

Young children are unable to think very critically about persuasive messages, so the heuristic and automatic cues in messages are most important (Buijzen et al., 2010). Thus, play with an attractive doll like Barbie might be an especially persuasive avenue for conveying different ideas about gender and jobs, as compared to less entertaining or attractive avenues, like simple discussion or a less attractive toy.

Taking Kuther and McDonald's (2004) finding that Barbie's career roles importantly affect how girls play with the dolls and the potential for Barbie to be highly influential on some girls' developing gender schemas, it is important to understand how information about careers and gendered behavior generally is conveyed through play with Barbie. Limited work to date has addressed this issue. In one study, preschool girls played with Barbie dolls depicting gender traditional and nontraditional careers (e.g., nurse vs. astronaut) in order to assess girls' identification with the dolls and girls' self-efficacy for the jobs (Coyle & Fulcher, 2011). Girls more often identified with Barbie dolls depicting feminine rather than masculine careers. However, playing with dolls dressed for masculine careers led to an increase in girls' self-

efficacy for and interest in masculine jobs. These results suggest that the dolls may serve as important career models.

The Risks of Sex-Typed Play

Although the research just described suggests potentially positive outcomes of having girls play with Barbie dolls that are depicted in traditionally masculine jobs, there may also be risks associated with playing with highly gendered toys such as Barbie. For instance, girls who play only or mostly with Barbie dolls may develop a greater degree of sex-typing and fail to develop the skills culturally associated with boys. Research (e.g., Stokes, Childs, & Fuehrer, 1981; Cheng, 2005; Liben, 2002) suggests that highly sex-typed individuals may be at a developmental disadvantage. Cheng (2005) found that sex-typed adults were more depressed than were androgynous participants when presented with hypothetical stressful situations. Liben (2002) found that children who engaged in more sex-typed activities performed worse on the National Geographic Bee, a national geography competition, than did children who engaged in more balanced activities.

In contrast, psychological androgyny, that is, possessing both masculine and feminine characteristics, may be advantageous. In the aforementioned stressful situations study, androgynous individuals showed the lowest levels of depression in comparison to sex-typed participants (Cheng, 2005). Androgyny has also been associated with increased emotional intelligence (Guastello & Guastello, 2003), increased well-being (Wolfram, Mohr, & Borchert, 2009), better adjustment (Lefkowitz & Zeldow, 2006), and better knowledge of how to cope in changing situations (Cheng, 2005).

Although psychological androgyny is assessed in terms of personality traits, the development of own- and cross-sex skills may factor into the types of traits boys and girls, men

and women endorse as self-descriptive. Broader behavioral and emotional skill sets may be important to developing self-efficacy, and playing with sex-typed toys such as Barbie may inhibit the development of a broader skill set and wider domains of efficacy. Therefore, encouraging less sex-typed play, or using play as a vehicle to learn to broach sex-typed boundaries, may be important in encouraging children to develop both own- and cross-sex capabilities. Sex-typing may also be reflected in the salience of gender as an affiliative category (Serbin & Sprafkin 1986) or the perception of gender transgressions as more severe (Smetana, 1986). Children whose gender is more personally salient or who perceive gender transgressions as more severe are also more sex-typed.

The Present Study

The purpose of the present study was to evaluate the effectiveness of an intervention using more or less feminized toys in increasing girls' interest in traditionally masculine jobs. Additionally, the present study explored whether individual differences in the gender salience filter (using measures of gender affiliation, typicality, and memory) would affect the outcome of the intervention. The current study used a computer game with either a more feminized (Barbie) or less feminized character (Playmobil). A blonde adult Playmobil doll was selected as the appropriate comparison because although comparable in skin tone, hair, and typical modality of play, this doll possesses a substantially less sexualized body. Playmobil dolls are popular but do not hold the same culturally iconic status as do Barbie dolls, nor do they represent a single, heavily defined character as does Barbie. Additionally, although Barbie is a physical doll, she also infiltrates other formats including movies and computer games. Therefore, the use of a computer game in the present study is consistent in mode with how many children interact with

her character yet also permitted increased control in creating two similar conditions differing only by the depicted doll, either Barbie or Playmobil.

Girls were assigned to either the Barbie or Playmobil computer game. The doll character was depicted in the game in a number of traditionally masculine and feminine jobs as well as four novel jobs. Children were told about each job and then asked to decide which depicted tools the character would need in order to perform that job. Liben, Bigler, and Krough (2001) used invented or rare occupations to test children's ideas about the status of jobs and their interest in them. The use of jobs that children had not encountered prior to the experimental session permitted the manipulation of the job depictions in terms of worker sex and removed the historical confounds of cultural prestige and traditionality with gender. In the current study, using novel occupations instead of familiar jobs permitted the manipulation of the gendered information of the doll (Barbie or Playmobil) alone. Whereas Liben and colleagues used the same description of a particular job and manipulated only who was performing the job, the present study manipulated the doll portrayed as the worker in order to permit contrasting the influence of each doll as a model.

Girls were evaluated at pretest for gender attitudes, memory, and self-perception of gender typicality and at posttest for interest in masculine or feminine activities and occupations. The intervention was anticipated to affect interest in jobs depicted in the game itself. Interest in other, non-depicted masculine and feminine jobs was included as a measure of generalization outside of the game. Interest in masculine and feminine activities was included as a measure of generalization from jobs to play.

Generalizability. An important caveat to the current research is the target sampling group and the generalizability of the results. Because Barbie is white, she is more representative

of European American children than of children of color. Although parents may make a conscious effort to purchase Barbies of color for their children, the overwhelming majority of dolls available and accessible in stores for purchase are white (Coyle, 2008; Steinberg, 2004). Indeed, many of the African American versions of the toys are special order only. Observational data suggest the unavailability of these toys. In the Barbie doll section of Amazon.com (Coyle, 2008), it is not until page four of the product listings (default 24 products per page) that the first doll of color appears who is not either a mythical, non-human creature, or a member of the Dolls of the World collection. The first doll of color who is not part of a special collection is on page seven and costs two dollars less than the white version of the same doll. Of the limited selection of Barbie Career Dolls at an urban Toys "R" Us in a racially diverse community, not a single doll was African American. The most prominently placed and available African American doll at an urban discount department store in a diverse, low-income neighborhood was the annual Holiday Barbie doll, available in equal numbers alongside her white counterpart. But, she cost $45, a price far beyond that charged for the typical Barbie which is commonly under ten dollars (Coyle, 2008).

Thus, the most affordable and available Barbie dolls for all girls are white. However, the influence and persuasiveness of a culturally iconic white doll might be importantly different for girls for whom Barbie is not representative than for those she does represent. Consequently, whether such a toy is persuasive for girls of color remains an important empirical question that must be addressed by a study designed explicitly for this purpose. Therefore, the present study recruited from the local geographical area produces a majority white sample. This means that the results should be considered to be informative for this particular demographic. Additional

research will be needed to examine the effects of game play in relation to children's race and ethnicity.

Additionally, socioeconomic status might be expected to determine how many Barbie dolls a girl owns and her access to those dolls. However, previous work with a mostly white sample found no relationship between the number of Barbies owned, nor frequency of play with Barbie, and girls' attitudes or change in attitudes about masculine jobs (Coyle & Fulcher, 2011). These findings suggest Barbie's ubiquity and girls' knowledge about the doll, irrespective of access at home. Thus, the results may indeed generalize across socioeconomic strata, within a white population. However, Bigler, Averhart, and Liben's (2003) comparison of African American elementary school children's interest in high and low status jobs indicates that SES may be an important factor in shaping job interests among girls of color. Bigler and colleagues measured African American children's beliefs about job status and interest in jobs using pictorial illustrations of jobs which varied by race, being either white or African American. They found that children conferred higher status to jobs with fewer African American workers and low status to jobs with more African American workers. However, among older children specifically, high SES children were most interested in high status jobs, while low SES children did not differentiate their interests by job status. Therefore, understanding the process by which an intervention using Barbie might work for girls of color deserves a study in its own right which can draw a more racially and socioeconomically diverse sample than that available for the current study.

Hypotheses. Based on Liben and Bigler's (2002) personal pathway model and previous research (Coyle & Fulcher, 2011), two primary predictions were made. First, in terms of the effect of the intervention on girls' personal interests in jobs specifically, girls in the Barbie

condition were expected to be more interested in the depicted masculine, feminine, and novel jobs than were girls in the Playmobil condition. These effects were expected to be affected by individual differences in gender salience filter. Girls with a stronger (high) gender salience filter (H-GSF) were expected to show the predicted effects more strongly than girls with a weaker (low) gender salience filter (L-GSF).

Second, with respect to the generalization of girls' interests from jobs to activities, girls in the more feminized (Barbie) condition were predicted to show an increase in their interest in both masculine and feminine activities after game play, relative to those girls in the less feminized (Playmobil) condition. This, too, should be affected by individual differences in gender salience filter, with H-GSF girls showing a stronger effect than L-GSF girls.

Chapter 2. METHOD

Participants

Participants were 46 preschool and kindergarten girls ranging in age from 48 to 69 months (mean of 57.86 months, *SD* = 5.63). For this study, children were sampled from two laboratory schools at a research university in rural Pennsylvania as well as a Washington State preschool that often participates in university research. All three of these schools serve predominantly white communities (about 70%), with a minority of Asian American and African American children as well.

Children were recruited through letters sent home to parents which described the study procedures and included a form for parents to return in the event they did not wish their child to participate. Children were tested at their respective schools in a quiet, adjacent room.

Procedure

Girls participated in two sessions administered by different experimenters. In session one, children were given, in order, (1) a measure of interest in masculine and feminine activities, the POAT-PM activities subscale; (2) a measure of gender affiliation; (3) a gender memory task; and (4) a measure of self-perceived gender typicality scale. After the first session, children were allowed to select stickers as a thank you for participation. Teachers provided girls' birthdays to allow calculation of the child's age in months at the time of the first session. See Appendix B for the script used in session one.

The experimental manipulation occurred in session two, one to two weeks after the first session. Girls were randomly assigned to the more feminized (Barbie) or less feminized (Playmobil) condition. The experimenter began by explaining that they were going to be playing a game with the child with a character on the computer and that the goal of the game was to learn

about different jobs and the necessary tools to perform those jobs. The experimenter started the game and introduced each job individually. For each job, the doll appeared on the screen with three tools. The experimenter explained the nature of each job and then the child searched for the two relevant tools and the one irrelevant tool for that job (e.g., fire hydrant and water for the firefighter, beach ball is irrelevant). Within each condition, girls played with all 4 masculine, 4 feminine, and 4 neutral jobs, but each job was depicted by the same type of doll.

After learning about each job and playing the computer game, children were again presented with each character in each job, and children rated their interest in that job on a 3-point Likert scale from "Not at all" to "A lot." Posttest measures were (1) a measure of interest in other masculine and feminine jobs, the POAT-PM occupations subscale and (2) the POAT-PM activities subscale again. Finally, children were given stickers as a thank you just as in Session 1. See C for the script used in session two.

Measures

Gender interests and beliefs. The Preschoolers: Occupations, Activities, and Traits (POAT; Liben & Bigler, 2002) pictorial measure of gender stereotyping was used to measure gender-related interests. Although the full scale assesses both attitudes and interests in the domains of occupations, activities, and personal traits, the subscales can be used independently. The occupations and activities interest subscales were used here. A sample item from the occupations scale includes "This job is a car mechanic, someone who fixes people's cars. How much would you like to be a car mechanic?" A sample item from the activities scale includes "How much do you like to play with dress up clothes?" Ratings were made on a 3-point Likert scale from "Not at all" to "A lot." Both the occupations and activities scales have shown good

reliability in previous research and were adequate in the present study (Cronbach's alphas between .65 to .82).

Gender salience filter. Gender salience filter was calculated as the summed Z-scores of three measures: (a) own-sex affiliation, (b) own-sex memory, and (c) gender typicality. Serbin and Sprafkin's (1986) measure of own-sex affiliation was used to measure the degree to which gender is a salient category for children in terms of affiliative preference. Affiliation was assessed by presenting children with five pairs of photos, each with a man and a woman, and asking with whom they would prefer to play. The women were shown with a blank expression and no props while the men were shown smiling warmly and holding an interesting game or toy. The proportion of instances a girl selected the women over the man for a play partner is the affiliation score. This score was Z-scored and included in the GSF composite score. This scale has shown high internal validity and test-retest reliability in scale development and previous use and was acceptable in the present study as well (alpha = .75).

Own-sex memory was measured using a method previously developed by Liben and Hilliard (2010). First, children were presented with 10 cards one at a time which depicted either a girl (5 cards) or a boy (5 cards) playing with a toy and children were asked to rate how much they would like to play with that toy. After a delay, children were presented with the 10 toy cards one at a time (no boy or girl present) and asked whether that toy was originally shown with a boy or with a girl. The proportion of items for which girls was recalled correctly served as a measure of children's attention to own-sex gender. This score was Z-scored and include in the GSF composite.

A measure of gender typicality was developed for use in the present study in order to assess the degree to which children perceived themselves as being like other girls or other boys.

Children were asked to rate their own similarity to boys and girls in terms of appearance, interest, competencies, and behaviors on a three-point scale from "not at all" to "a lot." Sample items include "Think about the things that most girls do. How much are you like that?" and "Think about the things that boys are good at. How much are you like that?" See Appendix D for the full measure. Scores were averaged for boy items and girl items to give a 1-3 score representing perceived similarity to girls and a score representing perceived similarity to boys. Cronbach's alphas show adequate reliability for boy items (.65) and girl items (.72). Alpha-if-item-deleted analysis suggested minor improvements were possible but not for the same type of question (e.g., appearance or interest) between girl and boy items so no adjustments were made here. The score for girl items was Z-scored and included as the third score in the GSF composite.

Doll materials. Barbie and Playmobil dolls were used for the computer game characters. A computer design was used in order to control length of play with the characters and equivalent depiction of careers and settings across the two types of dolls that in reality vary in size and wardrobe. The two versions of the game were written using the software GameMaker for Mac (http://www.yoyogames.com/make).

In the game, the dolls were depicted and described as performing 12 different jobs. Four jobs were traditionally feminine (librarian, teacher, nurse, florist), 4 were traditionally masculine (explorer, astronaut, firefighter, chemist), and 4 were novel jobs (benster, hegist, silter, tenic; see Appendix E for novel job descriptions) drawn from those used by Liben and colleagues (2001). See Appendix F for screenshots from the game.

Children's interest ratings of the depicted jobs were on the same Likert scale as the POAT-PM occupations subscale. Thus, three scores were produced: interest in novel jobs, interest in masculine jobs, and interest in feminine jobs. Because these ratings were made similar

to the POAT-PM ratings, alphas were also calculated but were found to be low, ranging from .47 for feminine jobs to .64 for novel jobs. The low reliability for feminine jobs may reflect that feminine jobs received the highest mean interest ratings with the least variability of the three categories of depicted jobs.

Chapter 3. RESULTS

Preliminary analysis

Correlations among demographic variables (age, race, school) and the study variables of interest revealed no significant associations. Therefore, demographic variables were not included in subsequent analyses. T-tests found no significant pre-test differences between girls included in the Barbie and Playmobil games in interests in masculine or feminine POAT-PM activities, $t(44)$ = 0.01 and 0.50, p = .937 and .622, respectively. See Table 1 for the range, mean, and standard deviation of all measures.

Hypothesis 1: Interest in jobs

The first hypothesis was that the highly feminized (Barbie) condition would be a more powerful intervention than the less feminized (Playmobil) condition such that girls' interest in the depicted jobs would be greater in the Barbie game relative to the Playmobil game. This was also expected to be affected by individual differences in gender salience filter, with H-GSF girls showing the effects more strongly.

Depicted jobs. This hypothesis was first tested with a series of three multiple regressions in which condition, gender salience filter, and the interaction, condition x GSF, were entered stepwise to predict each of the dependent variables: interest in depicted novel, feminine, and masculine jobs. Contrary to predictions, neither condition, GSF, nor their interaction were predictive of interest in novel (R^2 = .01, β = -.01, .06, and .10, p = .944, .790, and .666, for condition, GSF, and condition x GSF respectively) nor feminine jobs (R^2 = .07, β = .04, .37, and -.36, p = .802, .110, and .117, respectively). Condition and GSF were also not predictive of interest in depicted masculine jobs (R^2 = .13, β = -.05, .02, and -.37, p = .752, .933, and .098, respectively). However, because this was an exploratory intervention to test increasing girls'

interest in masculine jobs presented in a game-format, interest in game depicted jobs was probed further.

First, to examine the relationship between GSF and interest in depicted masculine jobs specifically, within the two game conditions, two linear regressions split by condition were conducted using GSF to predict masculine job interest. For girls playing the Playmobil game, GSF was again not predictive of interest in depicted masculine jobs (R^2 = .00, β = .02, p = .926). However, among girls playing the Barbie game, GSF was indeed predictive of interest in depicted masculine jobs but in the opposite direction as hypothesized (β = -.44, p = .03), such that girls with stronger gender salience filters were less interested in depicted masculine jobs. GSF explained 20% of the variance in depicted masculine job interest for girls playing the Barbie game. See Figure 2 for a visual representation of this relationship.

A median split was also used to divide girls into high and low GSF groups in order to examine separately the relationship between game condition and interest in the depicted masculine jobs. Two linear regressions split by GSF level were conducted using game condition to predict masculine job interest. Game condition did not predict masculine job interest for either high (R^2 = .01, β = .12, p = .600) or low GSF girls (R^2 = .03, β = -.17, p = .436).

To examine interest across job types more generally, a 3 (job type: novel vs. feminine vs. masculine) x 2 (condition: Barbie vs. Playmobil) x 2 (GSF level: high vs. low) mixed model ANOVA was conducted with job type as a within subjects variable and condition and GSF as between subjects variables. There was a significant main effect of Job Type, where girls were significantly more interested in feminine (M = 2.23, SD = 0.51) and novel jobs (M = 2.21, SD = 0.56) than they were in masculine jobs (M = 2.00, SD = 0.55), $F(2, 82)$ = 4.37, p = .016, η^2 = .10, regardless of game condition.

Generalization to other jobs. To examine generalization to other jobs outside of those depicted in the game, two multiple regressions were conducted with game condition, GSF, and condition x GSF entered as predictors of interest in masculine and feminine POAT-PM occupations. Neither game condition, GSF, nor their interaction were significant predictors of interest in masculine ($R^2 = .05$, $\beta = .00$, $-.31$, and $.15$, $p = .986$, $.178$, and $.507$, for condition, GSF, and condition x GSF respectively) nor feminine jobs ($R^2 = .03$, $\beta = -.05$, $.27$, and $-.20$, $p = .751$, $.248$, and $.387$, respectively).

As before, a mixed models ANOVA was conducted to compare mean interest in jobs by condition and GSF level. In this case, a 2 (job type: POAT-PM feminine vs. POAT-PM masculine) x 2 (condition: Barbie vs. Playmobil) x 2 (GSF level: high vs. low) mixed model ANOVA was conducted with job type as a within subjects variable and condition and GSF as between subjects variables. There was again a significant main effect of Job Type, where girls were significantly more interested in feminine ($M = 2.29$, $SD = 0.43$) than masculine jobs ($M = 1.84$, $SD = 0.53$), $F(1, 41) = 17.84$, $p < .001$, $\eta^2 = .30$, regardless of game condition.

Hypothesis 2: Generalization to activities

The second hypothesis was that the Barbie game, more so than the Playmobil game, would have effects on interests which generalize beyond jobs. Girls in the Barbie game were expected to increase both their interest in masculine activities and in feminine activities (POAT-PM activities) from pre- to post-test, relative to girls in the Playmobil game. As with Hypothesis 1, this was expected to be affected by GSF, with H-GSF girls showing greater condition effects than L-GSF girls.

Two multiple regressions were conducted where condition, GSF, and condition x GSF were entered stepwise to predict change in interest in masculine activities and change in interest

in feminine activities. Change scores from pre- to post-test were calculated for masculine and feminine POAT-PM activity scores. Contrary to predictions, neither condition, GSF, nor their interaction were predictive of change in interest in masculine activities (R^2 = .01, β = .02, -.02, and -.08, p = .873, .926, and .724, respectively) nor feminine activities (R^2 = .11, β = .06, -.07, and .37, p = .685, .755, and .103, respectively). Again given the exploratory nature of this intervention, further analysis was deemed appropriate to examine trends separately by game condition as well as by high and low GSF level.

As before, linear regressions split by condition were conducted to probe the relationship between GSF and change in activity interests. First, two regressions were conducted with GSF predicting change in feminine interests. GSF was not significantly predictive of feminine interest change for girls in the Playmobil condition (R^2 = .00, β = -.06, p = .792). However, for girls in the Barbie condition, GSF was indeed a positive predictor of change in feminine interests (β = .51, p = .013). Girls with a stronger GSF filter also showed a greater change from pre- to post-test in their interest in feminine activities, which partially supported the hypothesis that both feminine and masculine interests would increase more for GSF girls playing the Barbie game (see Figure 3). GSF accounted for 26% of the variance in change in interest in feminine activities for girls in the Barbie condition.

Two regressions split by game condition were also conducted with GSF predicting change in masculine interests. GSF was not predictive of change in masculine interest for girls in either the Playmobil (R^2 = .00, β = -.02, p = .929) or the Barbie condition (R^2 = .02, β = -.14, p = .509).

To explore within GSF level how game condition related to change in masculine or feminine interests pre- to post-game, linear regressions split by median-split GSF level were also

conducted. Game condition predicted (a) change in feminine interests and (b) change in masculine interests. For L-GSF girls, condition was not predictive of change in feminine interests (R^2 = .12, β = -.35, p = .109). However, for H-GSF girls, condition was indeed predictive of change in feminine interests (β = .57, p = .005) such that girls in the Barbie condition experienced greater change in their interest in feminine activities and H-GSF girls in the Playmobil condition experienced less change in their feminine interests. Game condition accounted for 32% of the variance in change in feminine interests for H-GSF girls.

Use of change scores permits consideration of a child's own change relative to herself. However, analyzing change in ANCOVA permits consideration of the child's change relative to the group. Therefore, change in feminine and masculine activity interests were also analyzed in this manner as well. First, pretest feminine activity interests, GSF, condition, condition x GSF, condition x pretest feminine interests, GSF x pretest feminine interests, and GSF x condition x pretest feminine interests were entered to predict post-test feminine interests. The model was significant, $F(7,37) = 7.40$, $p < .001$, and accounted for 58% of the variance. The beta for condition x GSF trended towards predicting post-test feminine interests, in the context of the other predictors (β =1.97, p = .061). Girls in the Barbie condition, with a stronger GSF, also had greater post-test feminine activity interests, controlling for pre-test interest. Complete model statistics are presented in Table 2.

As with the first ANCOVA, pretest masculine activity interests, GSF, condition, condition x GSF, condition x pretest masculine interests, GSF x pretest masculine interests, and GSF x condition x pretest masculine interests were entered to predict post-test masculine interests. Although the model was significant, R^2 = .50, $F(7, 37) = 5.30$, $p < .001$, the only

individually significant beta was that for the pre-test interest in masculine activities ($\beta = .47$, $p = .017$). Complete model statistics are presented in Table 3.

To examine change in activity interests more broadly, a 2 (item type: masculine vs. feminine) x 2 (time: pre- vs. post-game) repeated measures ANOVA was also conducted, with condition (Barbie vs. Playmobil) and median-split GSF (high vs. low) as between subjects factors. There was a main effect of item type, where all girls, regardless of GSF level or condition, were more interested in feminine ($M = 2.45$, $SD = .07$) than masculine activities ($M = 1.69$, $SD = .07$), $F(1, 41) = 58.06$, $p < .001$, $\eta^2 = .59$. There was no significant main effect of time, $F(1, 41) = 2.09$, $p = .156$, $\eta^2 = .05$.

There was a significant item type x GSF level interaction, $F(1, 41) = 4.89$, $p = .033$, $\eta^2 = .11$, such that the difference between interest in feminine versus masculine activities was greater for H-GSF girls (M for feminine $= 2.53$, M for masculine $= 1.55$) than L-GSF girls (M for feminine $= 2.34$, M for masculine $= 1.84$), across game condition. See Figure 4 for an illustration of this relationship.

There was also a significant interaction among condition, time, and GSF level, $F(1, 41) = 8.85$, $p = .005$, $\eta^2 = .18$. In the Barbie condition, interest in activities (regardless of type) decreased from pre- to post-test for L-GSF girls (M pre-test $= 2.21$, $SE = .11$, M post-test $= 1.98$, $SE = .12$) but increased pre- to post-test for H-GSF girls (M pre-test $= 2.04$, $SE = .10$, M post-test $= 2.17$, $SE = .10$). In the Playmobil condition, interest in activities showed little or no change, regardless of GSF level (see Figure 5). This provides limited support for the hypothesis that the Barbie game would be a stronger intervention than the Playmobil game. However, the Barbie game served to increase H-GSF girls' interests but decrease L-GSF girls' interests.

Chapter 4. DISCUSSION

As predicted, findings showed that the Playmobil game had little impact on girls'
interests in jobs or activities, irrespective of individual differences in GSF. In contrast, the Barbie
game had significant effects, which varied with GSF differences, on some but not all job and
activity interests. Contrary to the first hypothesis, girls' interests in novel and feminine jobs were
not higher in the Barbie game than the Playmobil game. However, when analyzed separately by
condition, H-GSF girls (but not L-GSF girls) in the Barbie condition showed less interest in the
game-depicted masculine jobs. Game condition and GSF also failed to predict interest in
masculine or feminine POAT-PM jobs, suggesting the effects of the Barbie game on H-GSF
girls' interests did not generalize beyond the depicted jobs. All girls, regardless of GSF level of
game condition, were more interested in feminine than masculine jobs.

Game condition and GSF level did not predict change in interest in masculine activities
from pre- to post-test. However, again when analyzed separately by condition, change in interest
in feminine activities was greatest for girls with a stronger GSF. Additionally, H-GSF girls drew
a greater distinction in their interest in masculine versus feminine activities, especially liking
feminine activities and disliking masculine activities, whereas L-GSF girls drew a weaker
distinction between the two. However, all girls, regardless of GSF level or game condition, were
more interested in feminine than masculine activities at both pre- and posttest. For H-GSF girls,
collapsed interest in masculine and feminine activities increased from pre- to post-test in the
Barbie game, suggesting engagement with the game, while L-GSF girls decreased in their
interest, suggesting reactivity against the game.

Intervention efficacy

Taken together, these findings suggest the Barbie intervention was more powerful for H-GSF girls, but only in the context of play and not jobs. H-GSF girls may have interacted with the game and the Barbie character on the level of activities without prompting more general cognitions about jobs. Interestingly, not only was the intervention ineffective for L-GSF girls, results also suggest some reactivity against the Barbie game where after playing the game, L-GSF girls disengaged. Perhaps most importantly, the findings suggest that for H-GSF girls, playing a highly feminized game increased feminine interests without also increasing masculine interests. Indeed, for girls playing the Barbie game, stronger GSF was associated with less interest in the depicted masculine jobs. This increase in interests in feminine activities, coupled with a failure to increase interests in masculine jobs, suggests that the intervention had an effect that was the inverse of the one that was intended. In short, for girls with a strong GSF, the highly feminized model approach may not be an effective approach for increasing interest in gender nontraditional areas like STEM jobs.

Weisgram and Bigler's (2006) evaluation of an intervention which used female role models in STEM fields to increase adolescent girls' interest in science should be again considered here. Although the authors found that the intervention increased girls' interest in and self-efficacy for science, they found no difference between the intervention and a condition that included the female role models with a focus on the traditionally feminine value of altruism in work. Adding the extra traditionally feminine focus did not increase girls' interest in or self-efficacy for science above and beyond the changes resulting from the intervention itself. The current study also included the contrast between more and less feminized female models of nontraditional activities and found no increased effectiveness of the more feminized (Barbie)

model in increasing culturally nontraditional interests, but did find unintended increases in feminine interests. These results, along with Weisgram and Bigler's (2006) findings, provide important preliminary evidence that the intervention approach of using a highly feminized context to reach more gender-focused girls is not successful.

However, such programs may be on the rise. The Science Cheerleaders is one such program. The Science Cheerleaders are former NFL cheerleaders currently employed in scientific fields, who do cheerleading performances to tout the importance of science. The logic behind such an intervention is similar to that applied to the current study: More feminized models will be more successful in engaging gender-focused girls to expand their interests in new directions. The results of the current study put that logic into question. Clearly more intervention evaluation is needed to resolve what the best approach to interest change is for girls who place great importance on gender.

Gender salience filter

The current study also provides an important test of Liben & Bigler's (2002) gender salience filter. The current study offers a preliminary understanding of individual differences in GSF and suggests the importance of considering GSF in interaction with intervention. For example, a greater distinction between masculine and feminine interests was found for H-GSF versus L-GSF girls, suggesting that H-GSF girls, even by preschool, draw an important personal distinction between masculine and feminine categories. Given the interaction between GSF level and game condition on interests in feminine activities and on interests in game-depicted masculine jobs, these results highlight the importance of measuring GSF strength as an individual difference variable.

Moreover, the results also suggest the highly feminized Barbie game may have been differentially appealing or engaging for girls depending on their GSF level. For H-GSF girls, they increased in their interest in activities generally from pre- to post-test. In contrast, L-GSF girls decreased in their interest in activities at post-test, suggesting reactivity against the feminized character, or lack of interest in continuing an interview session which began with a game centered around a feminized character. No such differences emerge in the Playmobil condition for either H-GSF or L-GSF girls. Thus, gender salience may also importantly affect a child's desire to approach and interact with a particular toy. This is indeed what would be predicted by Liben and Bigler's (2002) model, with the H-GSF girls approaching the Barbie game more and coming away from it with somewhat revised ideas about gender, and the L-GSF girls avoiding it and concluding the session with no change in their ideas about gender. These results therefore provide preliminary empirical support for the role of the GSF filter in the modification of girls' gender schemas.

Limitations and future directions

Although the present study represents an important contribution to understanding individual differences in GSF in combination with intervention, it is also important to consider its limitations. First, the present study was limited by its sample of only girls. Although the intervention was designed to target girls specifically, the gender salience filter is a general construct theorized to operate in boys as well as in girls. Thus, future replication of these patterns in a sample that also includes boys would lend more weight to the current conclusions and would further expand our understanding of the role of the GSF filter in modifying gender schemas.

The second important limitation concerns generalizability to different groups of girls. As discussed in the introduction, there is reason to be cautious about generalizing these results

beyond the middle class, majority white sample from which they were drawn. Primarily, these concerns derive from previous work that finds differences in how career interests interact with socioeconomic status and race (e.g., Bigler et al., 2003). However, the current findings suggest that what drove interest in the game may actually have been relative strength of the GSF, with interest in jobs being less primarily a factor. As the GSF is theorized to be a universal process of gender development, the findings might indeed generalize more broadly than was anticipated at the outset of the present study. Moreover, Clark and Clark's (1947) classic work with African American children and white and black dolls suggests that for many African American girls, a white doll may indeed be viewed as an attractive toy. Spencer's (2010) recent replications of this work, gives support to the hypothesis that at least for girls of color who are themselves H-GSF, a highly feminized doll like Barbie might still be desirable, and therefore, an intervention like the present study might have similar outcomes on gender interests and ideas. However, this remains something to be resolved in replication with a more racially, socioeconomically, and geographically diverse sample.

Conclusions

The current study suggests that interventions which seek to capitalize on girls' interest in play with highly feminized toys like Barbie in order to increase girls' interest in gender-nontraditional activities may actually backfire for some girls. The current study is an important first step in understanding how to measure GSF strength, and highlights the importance of including GSF as a meaningful individual difference variable for research on gender development.

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APPENDIX A
Tables and Figures

Table 1

Descriptive Statistics for All Measures

Measure	Min	Max	*M*	*SD*
POAT-PM Activities: Feminine (Pre-test)	1.17	3.00	2.49	0.45
POAT-PM Activities: Feminine (Post-test)	1.00	3.00	2.44	0.59
POAT-PM Activities: Masculine (Pre-test)	1.00	2.83	1.71	0.48
POAT-PM Activities: Masculine (Post-test)	1.00	2.83	1.67	0.53
POAT-PM Occupations: Feminine	1.33	3.00	2.27	0.42
POAT-PM Occupations: Masculine	1.00	3.00	1.84	0.53
Own-Sex Affiliation	0.00	1.00	0.56	0.30
Own-Sex Memory	0.20	1.00	0.81	0.20
Girl Typicality	1.60	3.00	2.60	0.44
Boy Typicality	1.00	2.60	1.71	0.49
Game-Depicted Feminine Job Interest	1.25	3.00	2.23	0.51
Game-Depicted Masculine Job Interest	1.25	3.00	2.00	0.55
Game-Depicted Novel Job Interest	1.00	3.00	2.21	0.56

Table 2

ANCOVA Predicting Post-Test Feminine Activity Interests

Predictor	β	t	p
Pretest POAT Feminine Activity Interests	0.82	4.73	<.001
GSF	-1.52	-1.48	.15
Game condition	0.44	0.63	.53
GSF x Condition	1.97	1.93	.06
Pretest Feminine Interests x GSF	1.49	1.49	.15
Pretest Feminine Interests x Condition	-0.35	-0.51	.61
Pretest Feminine Interests x GSF x Condition	-1.74	-1.72	.09

Note. $R^2 = .58$.

Table 3

ANCOVA Predicting Post-Test Masculine Activity Interests

Predictor	β	*t*	*p*
Pretest POAT Masculine Activity Interests	0.47	2.50	.02
GSF	0.06	0.10	.92
Game condition	-0.50	-1.02	.31
GSF x Condition	0.46	0.59	.56
Pretest Masculine Interests x GSF	-0.30	-0.57	.57
Pretest Masculine Interests x Condition	0.54	1.01	.29
Pretest Masculine Interests x GSF x Condition	-0.41	-0.56	.58

Note. $R^2 = .50$.
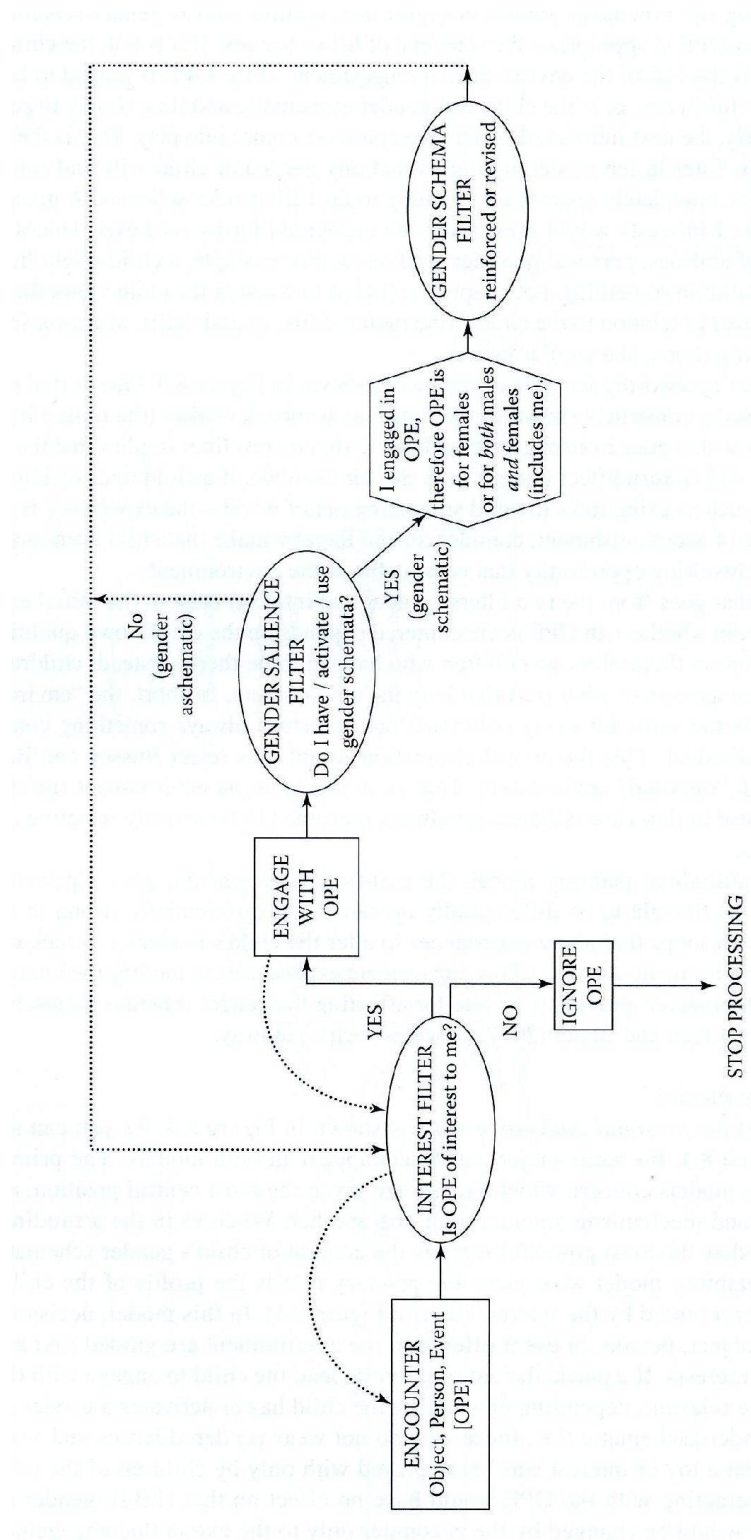
Figure 1. Liben & Bigler's (2002) personal pathway model for a female. From Blakemore et al., 2009.
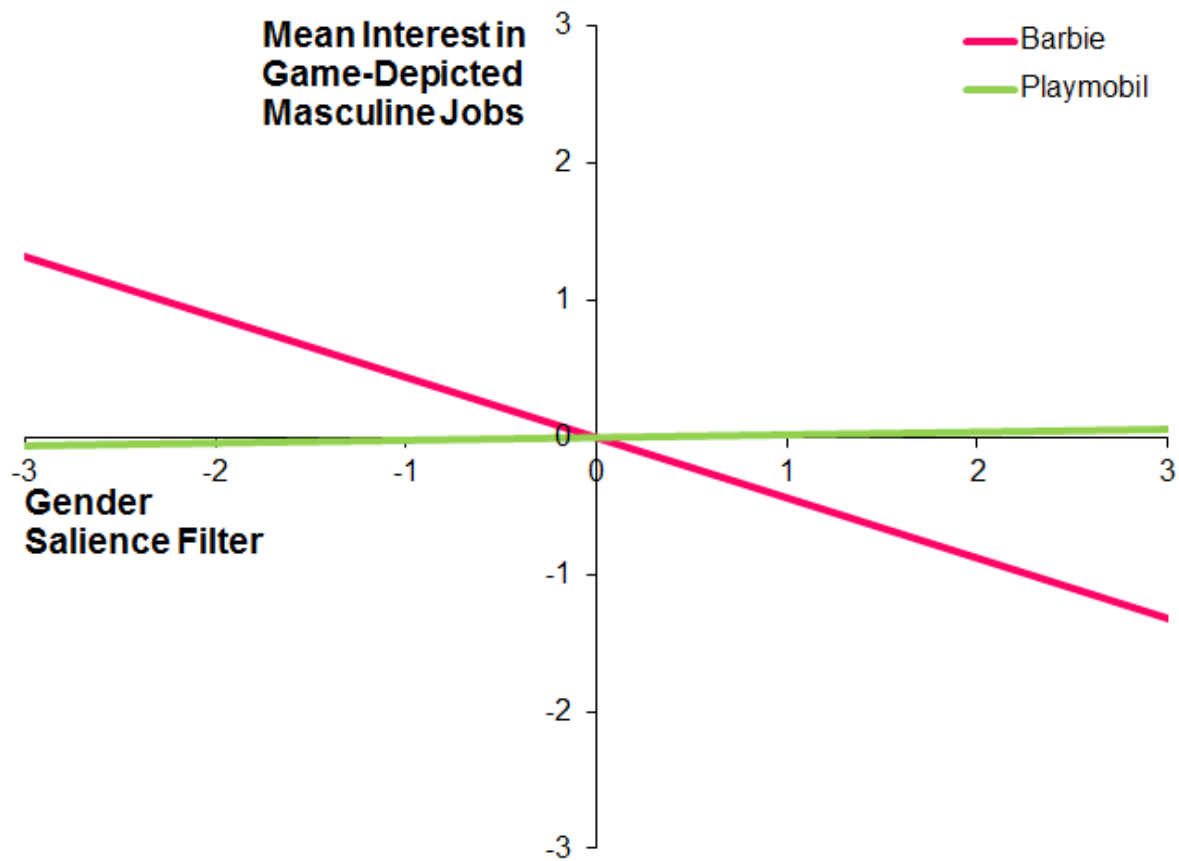
Figure 2. Mean interest in depicted masculine jobs as a function of gender salience filter level.

Interest in masculine game-depicted jobs was the average of ratings of the 4 depicted masculine

jobs, on a 3-point Likert scale from "Not at all" to "A lot." GSF was the sum of three Z-scores:
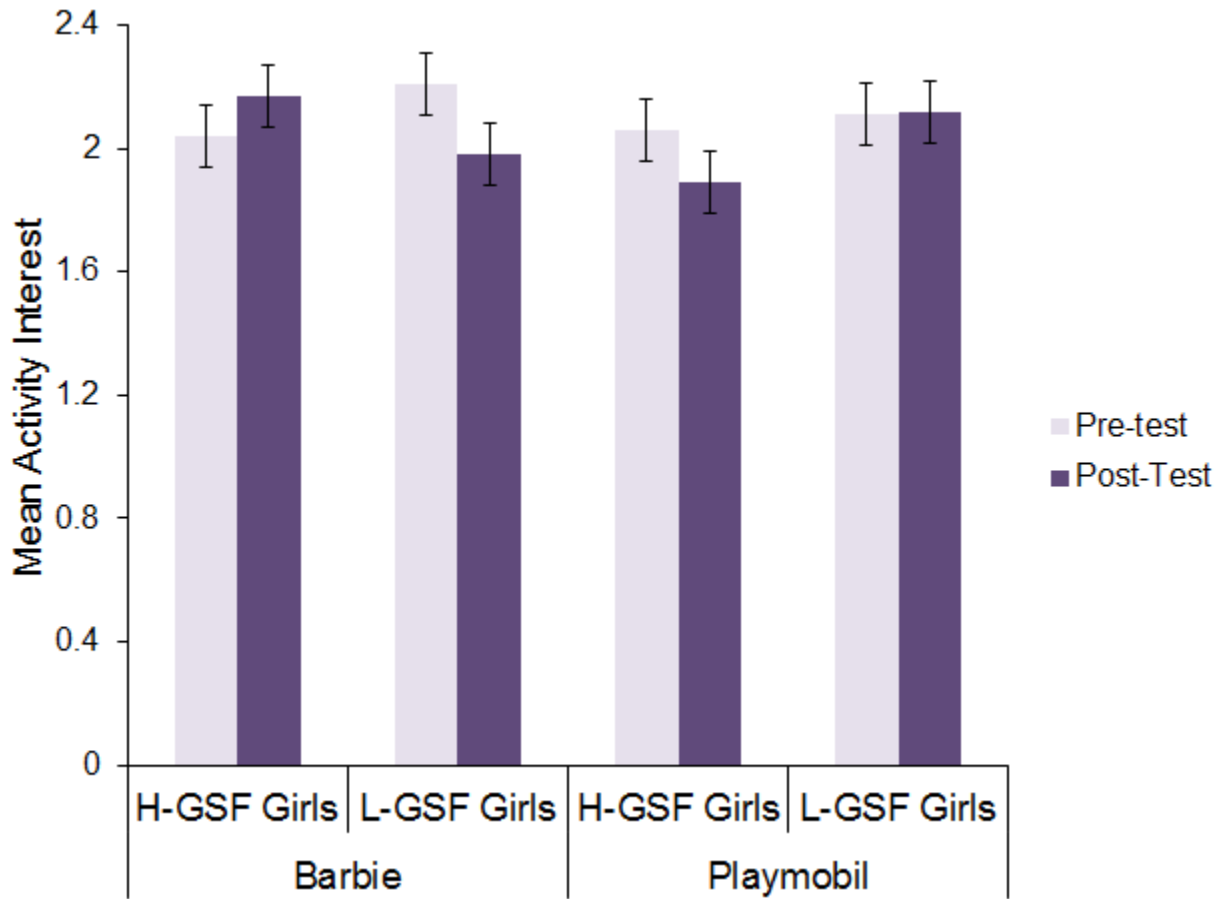
own-sex affiliation, own-sex memory, and girl typicality.
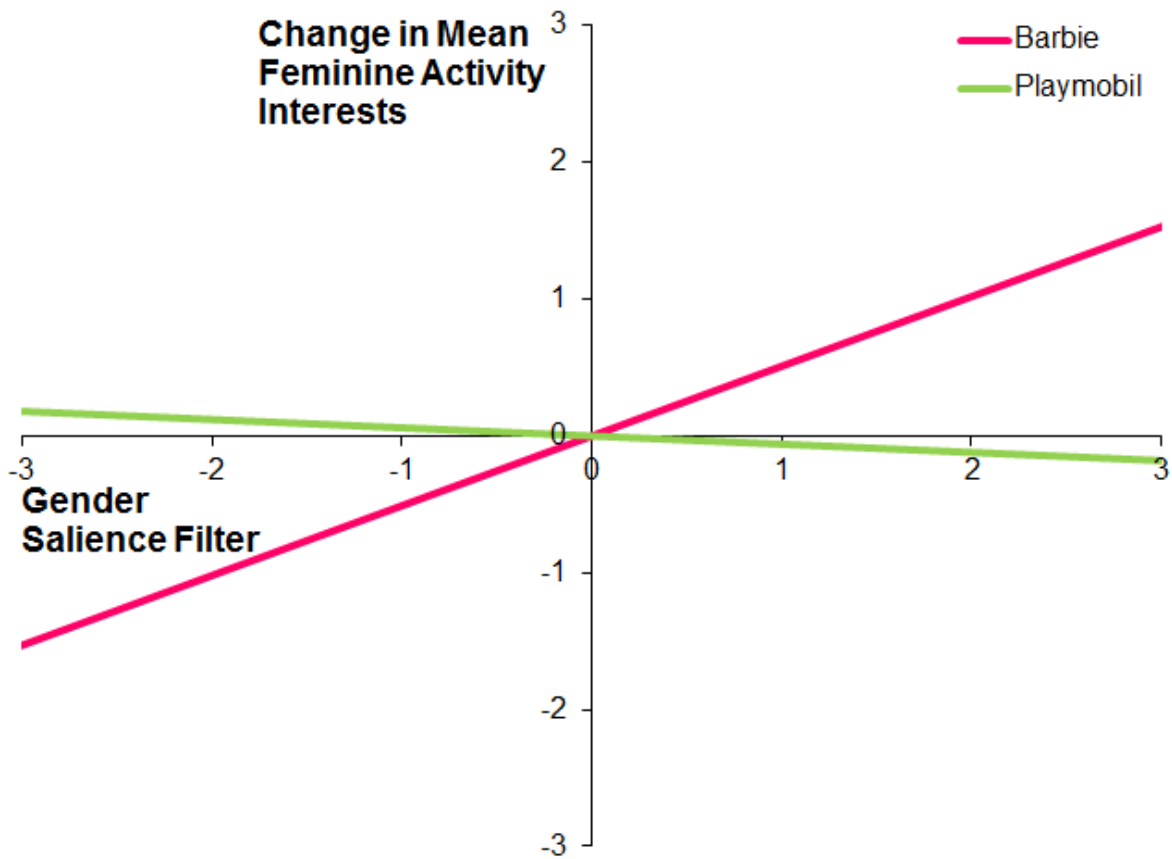
Figure 3. Change in mean interest in feminine activities as a function of gender salience filter

level. Feminine activity interests as measured by the POAT-PM feminine activities subscale

were rated on a 3-point Likert scale from "Not at all" to "A lot." GSF was the sum of three Z-

scores: own-sex affiliation, own-sex memory, and girl typicality.
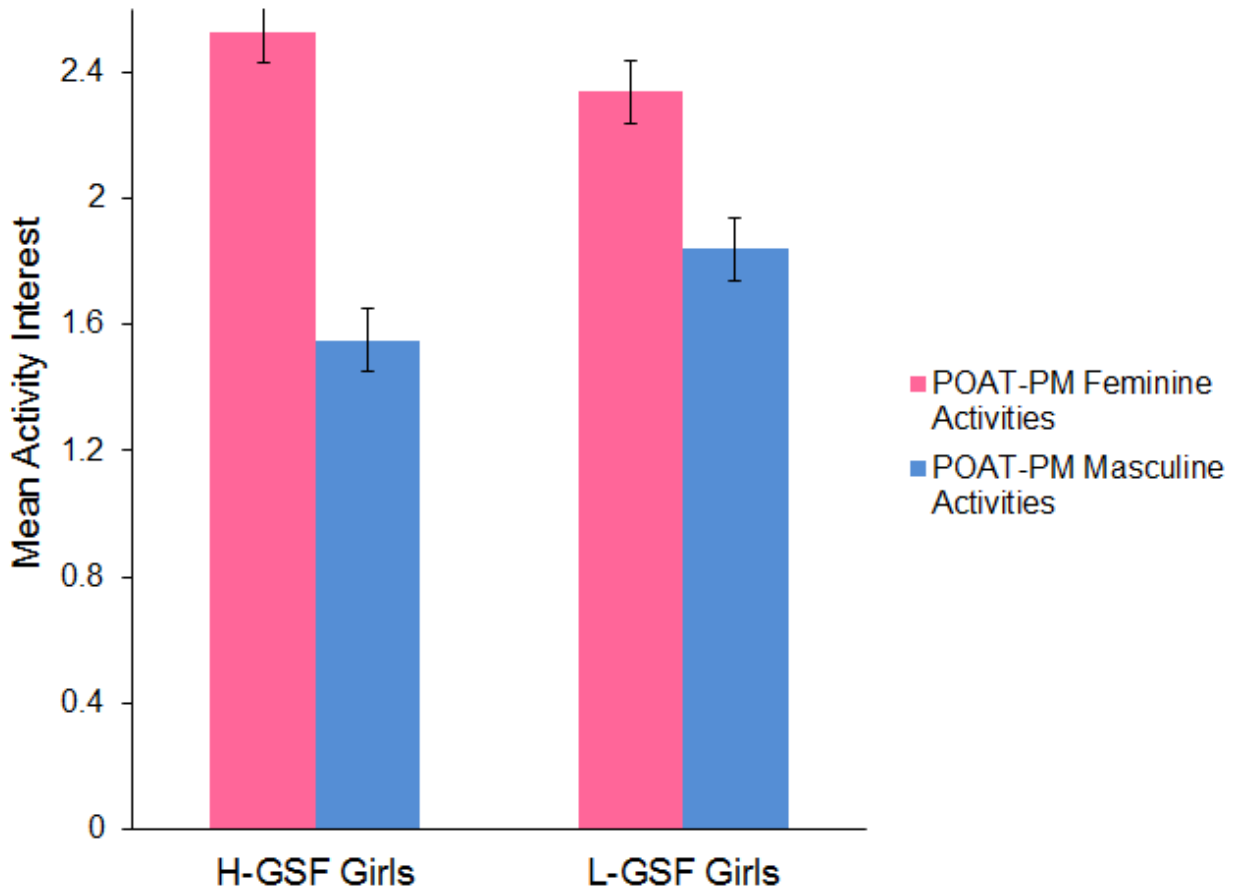
Figure 4. The difference in interest in masculine and feminine activities for high versus low gender salience filter girls. Interest in masculine and feminine activities was measured by the POAT-PM activities subscale and rated on a 3-point Likert scale from "Not at all" to "A lot." GSF was the sum of three Z-scores: own-sex affiliation, own-sex memory, and girl typicality.

Figure 5. Change in combined interest in activities by gender salience filter level and game. Activity interests were measured by the POAT-PM activities subscale and were rated on a 3-point Likert scale from "Not at all" to "A lot." Interest in feminine and masculine activities are collapsed here into a single activity interest score. GSF was the sum of three Z-scores: own-sex affiliation, own-sex memory, and girl typicality.

APPENDIX B
Script for Session One

Assent

Hi. My name is ____ and I am doing a project at your school [*revise as needed for testing context*]. The school and your teacher said it was okay for me to visit your school to do my project. For my project, I have cards with pictures of toys and activities and I am asking children some questions about these pictures. I am trying to learn about what children think about some things and what they are like. Different children think different things and they like different things, and that is fine! I'm just really interested to hear what *you* think and what *you* like to do. Are you willing to help me so I can learn more about what children think? ***Assuming the child says yes, continue. If not, thank child for thinking about it and then end the session.***

POAT-PM activities

The first thing that I want to do is to learn about you. I am interested in what you like to do and what you are like. There are no right or wrong answers; I just want to know how much *you* like some things. I am going to ask you to use these glasses to show me how much you like things…

> If you *don't like something at all*, you should point to this one. (point to card w/ empty glass);
> If you *like something some,* you should point to this one. (point to card w/ half-full glass);
> If you *like something a lot*, you should point to this one. (point to card w/ full glass);

Let's try one. Suppose I ask you about how much you like to eat ice cream. (*Show appropriate picture to child for this and all subsequent parts of the POAT, here the picture of ice cream.*) So, point to one of the these (*sweep hands from left to right across the three cards*) to show me how much you like to eat ice cream: not at all, some, or a lot (*experimenter holds picture of ice cream, points to appropriate glass, in turn, when reading answer choices*). So, point to one to show me how much you like to eat ice cream. (*Respond by saying* ―OK, so that means you *don't like ice cream/ like ice cream some/ really like* ice cream.‖ Great! You seem to understand how to use these cards.

Now we're going to use these cards again so you can show me how much you think you would like to play with different toys. So I'm going to ask you about some toys, and I want you to tell me how much you like to play with them. There are no right or wrong answers. I just want to know how much you would like to play with each toy.

> If you do *not like* to play with something or do the activity at all, point to this one (card w/ empty glass);
> If you like to play with something or do the activity *some*, point to this one (card w/ half-full glass)
> If you like to play with something or do the activity *a lot*, point to this one (card w/ full glass).

OK, so let's begin with this one. How much do you like to play with _____? Not at all? A little bit? A lot?

[POAT-PM activity cards]

Good job! You get a star sticker for helping me with that! You can choose whichever color you would like. Let's put it on this certificate. We'll add stars to this for every activity we do today. (*pull out certificate and add one star*)

Memory
PHASE 1:

> *Sit in front of child with* **scrambled** *pack of 10 photo cards (children with toys; 5 girls and 5 boys). Counterbalance so that each S gets either set I or set II (varying which toys are portrayed with boys vs. girls).*

I'm going to ask you some more questions about toys that kids like to play with. I've got some more pictures of different toys and I just want you to look at each one and then tell me how much you think you would like to play with the toy.

We'll do this just like before with the glasses. if you don't think you would like to play with the toy at all, point to this one; if you would like to play with it some, point to this one; if you would like to play with it a lot, point to this one. OK?
So, let's look at the first one."

> *Show one card at a time and ask,*

"How much would you like to play with this toy?" Not at all, a little, or a lot?" (pointing to face cards)

Affiliation
Now I am going to show you different people you might play with. I want to know which person you would want to play with more.
(shuffle Deck 1 men and women and present in pairs)
Which of these people would you want to play with more? Would you want to play with this person? Or this person? (*point to each; based on their responses to all five pairs, select Deck 2 or 3 to proceed – if they select majority women, use Deck 2. If majority men, Deck 3*)

Now I am going to show you some other people you could play with. We're going to do the same thing and I just want you to tell me which person you would like to play with.
(shuffle the deck you are using and present in pairs of men and women)
Which of these people would you want to play with? Would you want to play with this person? Or this person?

Great! Let's add another star to your certificate (*add star*)

Memory
PHASE 2:
"Now we're going to play a game to see how well you remember which children were playing with the toys that I showed you!
> *Scramble cards with toys ONLY and show one at a time.*
"Can you remember if it was a <u>boy</u> or a <u>girl</u> that you saw playing with this toy before?"

Good! Let's add another star to your certificate (*add star*)

Gender typicality
Now I'm going to ask you some questions about yourself and what you are like. We're going to use these cards again (*lay out cards with water glasses*)

So, I'm going to tell you about some ways people are and things people do, and I want you to tell me how much <u>you're</u> that way. We're going to use these same cards.

      If you <u>are not that way at all,</u> point to this card (card w/ empty glass);

      If you are <u>that way some</u>, point to this card (card w/ half-full glass), and

      If you <u>are a lot that way</u>, point to this card (card w/full glass).

Again, there are no right or wrong answers. I just want to know about the ways *you* are.
(*practice item:*)
Think about kids who eat pizza. (PAUSE) How much are YOU like that? Not at all? Some? A lot?

 [administer typicality questions, PAUSE after each statement before asking question.]

Good work! Let's add another star. (*add star*)

Stickers
You did a great job today! Thank you for your help! As a thank you for helping me with all of my questions, I'm going to let you take home some stickers.

APPENDIX C
Script for Session Two

Assent
Hi. My name is _____ and I am doing a project at your school [*revise as needed for testing context*]. The school and your teacher said it was okay for me to visit your school to do my project. For my project, I have a computer game and some different activities to play with you. I'm really interested in what you think about different jobs and what you want to do when you grow up. Are you willing to help me so I can learn more about what you think? ***Assuming the child says yes, continue. If not, thank child for thinking about it and then end the session.***

Game
We're going to play a game and learn about some different jobs. I'm also going to ask you some questions. There are no right or wrong answers; I just want to know how much *you* like some things. Sometimes when grown-ups ask kids these questions, they use these cards to help kids answer. I am going to ask you to use these glasses to show me how much you like things…

> If you *don't like something at all*, you should point to this one. (point to card w/ empty glass);
> If you *like something some,* you should point to this one. (point to card w/ half-full glass);
> If you *like something a lot*, you should point to this one. (point to card w/ full glass);

Have you seen these glasses before? (*if no, do ice cream example. Probably child will remember from session 1*)

Ok. Let's play the computer game! We're going to watch Barbie (Playmobil: Jane) do all sorts of different jobs. For each job, let's find the two things that Barbie (Jane) needs to do her job. There will be one thing that will not help her! We'll find that too. Let's try one.

FIRST read the "this job is ___, someone who ___." THEN find the tools she needs and the one she does not need.

Great! Now I'm going to ask you a couple of questions about the different jobs. I want to know what YOU think about these jobs.

 "how much would <u>you</u> like to be a(n) ___?" *(use cards for rating)*

POAT-PM Occupations
That was a fun game! I have some pictures of other jobs that we didn't talk about in the computer game. I want you to use the same cards to tell me how you would like to do that job when you grow up.

OK, so let's begin with this job. This job is _____, someone who _____. So, how much would you like to be a(n) _____? Not at all? A little bit? or A lot?

[POAT-PM Occupations cards]

POAT-PM Activities
Great. Now instead of jobs, I'm going to ask you about some toys and things to do and I want you to tell me how much you like to play with them. We'll have pictures again to help.

> If you do *not like* to play with something or do the activity at all, point to this one (card w/ empty glass);

       If you like to play with something or do the activity *some*, point to this one (card w/ half-full glass)

       If you like to play with something or do the activity *a lot*, point to this one (card w/ full glass).

Again, there are no right or wrong answers. I just want to know how much you would like to play or do these things.

OK, so let's begin with this one. How much do you like to play with _____? Not at all? A little bit? A lot?

[POAT-PM Activities cards]

Stickers
You did a great job today! Thank you for your help! As a thank you for helping me with all of my questions, I'm going to let you take home some stickers. I have two different kinds of stickers and you get to pick. Thank you for helping me! Let's put these stickers in an envelope and seal it so you can take them home after school today. How about I will put them in your cubby so that you will have them when you go home from school today?

APPENDIX D

Typicality Measure

Think about _____. How much are YOU like that?	Not at all	Some	A lot
Think about the way that most boys look. (R) How much are YOU like that?			
Think about kids who play soccer.			
Think about the things that most girls do.			
Think about the way that most boys dress. (R)			
Think about kids who ride bikes.			
Think about the way that most girls look.			
Think about kids who play outside.			
Think about the way that most boys act. (R)			
Think about kids who play with pet animals.			
Think about the things that girls are good at.			
Think about kids who do puzzles.			
Think about the things that boys are good at (R)			
Think about kids who read books.			
Think about the way that most girls dress.			
Think about kids who eat ice cream.			
Think about the things that most boys do. (R)			
Think about the way that most girls act.			

APPENDIX E
Novel Job Descriptions
(from Liben, Bigler, and Krough, 2001)

Benster is a person who studies deer. A benster collects information about where deer live, how much food they need, and how to keep them off the highways.

Heigist is a person who tests the quality of the water in a city. A heigist makes sure the drinking water is safe to drink.

Tenic is a person who is in charge of creating handicapped parking places. A tenic does things like decide how many handicapped parking spaces there should be.

Silter is a person who checks pearls from the ocean. A silter sorts the pearls into those that are best in quality and those that have cracks or brown spots.

APPENDIX F
Screenshots from the Computer Game

Feminine jobs:

Teacher

Florist

Librarian

Nurse

Masculine jobs:
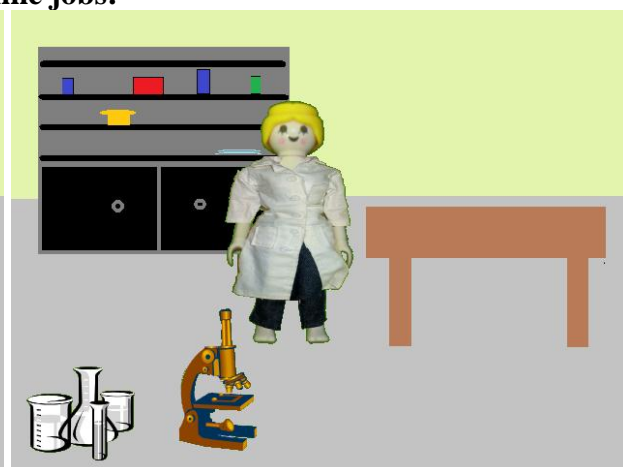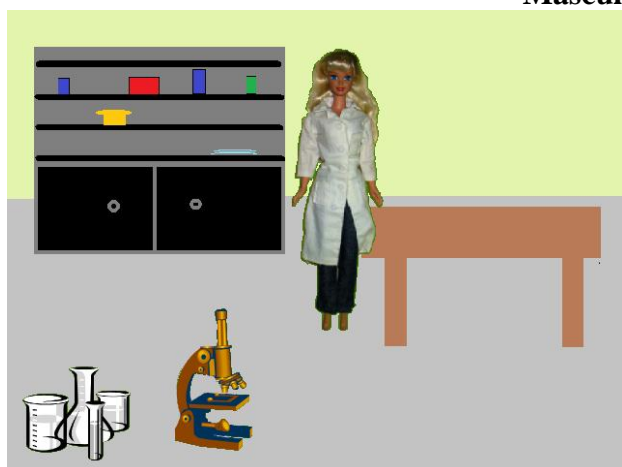
Chemist
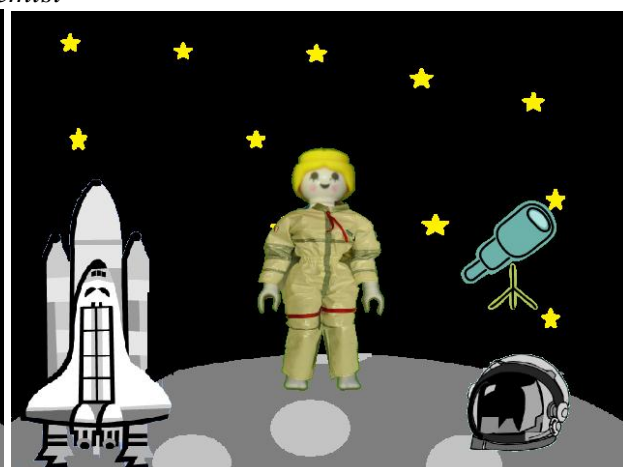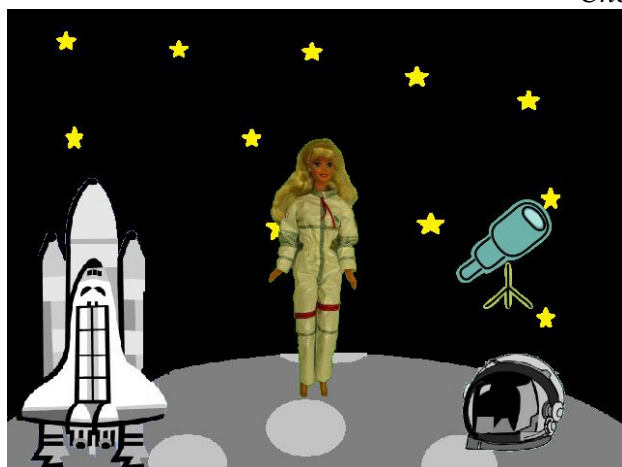
Astronaut

Explorer

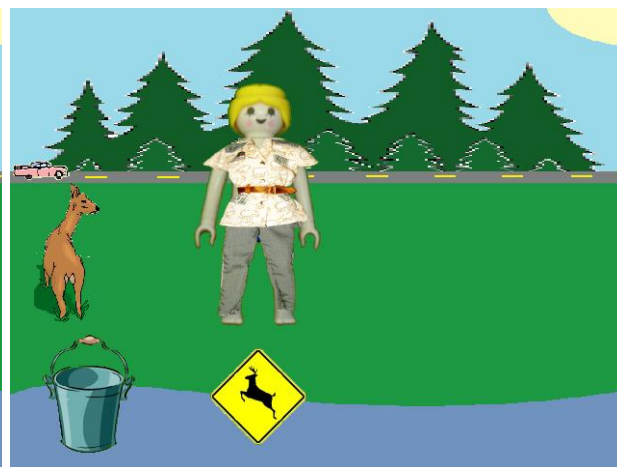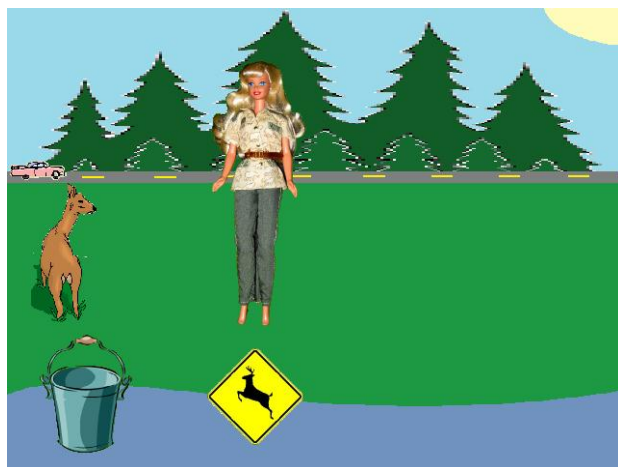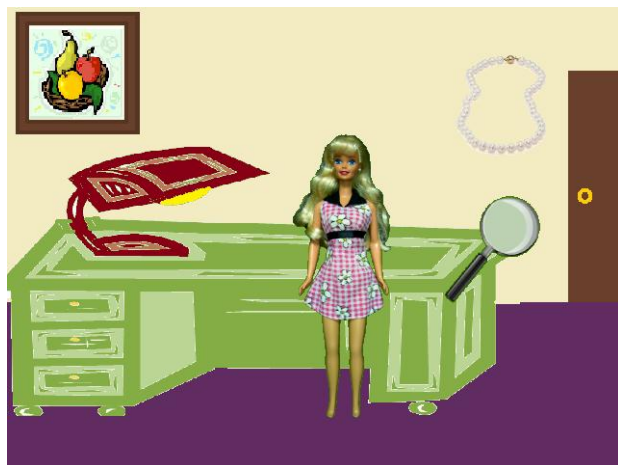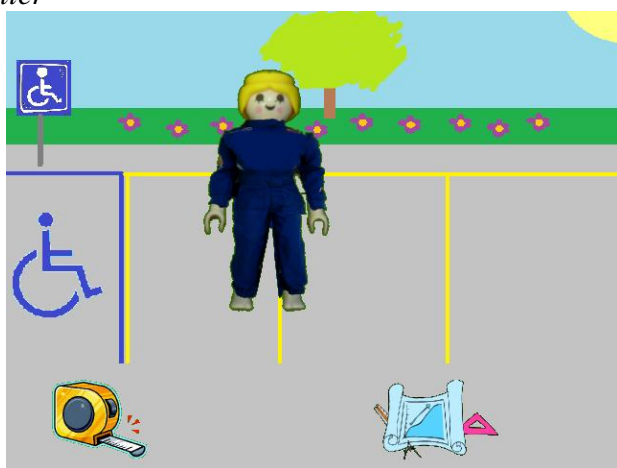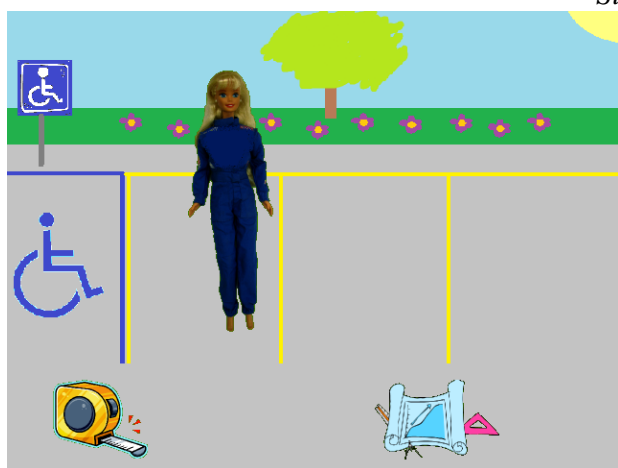*Firefighter*

Novel jobs:

Heigist

Benster

Silter

Tenic