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Gender-Based Processing in Children: Developmental Patterns and Relationships with Indices of Sex-Role Acquisition

Carol Sprafkin

A Thesis

in

The Department

of

Psychology

Presented in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy at
Concordia University
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October 1985

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ABSTRACT

Gender-Based Processing in Children:
Developmental Patterns and Relationships with Indices of
Sex-Role Acquisition

Carol H. Sprafkin, Ph.D.
Concordia University, 1985

Predictions derived from a relatively new model of sex-role development, proposed by Bem (1981, 1984), were examined. This model, based upon schema theory, proposes that gender becomes a salient cognitive category for children, due to perceptual and environmental factors, and that information is then processed along this dimension in a manner that facilitates the learning of traditional sex-role norms and hinders awareness of counterstereotyped information. To determine whether processing of information along the gender dimension occurs in young children and to elucidate the role it may play in sex-role development, 147 boys and girls between the ages of three and seven were administered two measures designed to assess gender-based processing. One of these measures assessed the frequency with which new pictorial information is categorized on the basis of gender as opposed to alternative cues and the other measured use of the gender dimension in making personal

affiliation choices when other relevant cues are available. Children were also administered measures of sex-typed preference, sex-role knowledge, and flexibility of sex-role attitudes. Questionnaires assessing parental sex-role attitudes and behaviors were completed by mothers. Results showed that gender-based categorization was determined largely by the child's level of cognitive maturity. It was highest among the three-year-olds and decreased with age, virtually disappearing in most children by seven. Guttman analyses revealed that, for individual children, gender-based categorization decreased only after basic aspects of sex-role knowledge were mastered, suggesting that it may be important in the learning of sex-role norms. Guttman analyses also revealed that a decrease in gender-based categorization occurs prior to the achievement of flexible sex-role attitudes, suggesting that diminished cognitive reliance upon rigid gender categories may allow the child to accept nontraditional viewpoints. Correlations between the data of girls and their mothers suggested that children low in gender-based categorization are, indeed, more receptive to environmental influences than those obtaining high scores on this measure. However, findings for the boys were less clear. Gender-based affiliation choices showed a different pattern as they did not decrease with age, displayed more variability across

children, and were related to scores on traditional measures of sex-typed preference. It may be that this cognitive process underlies the maintenance of sex-typed preferences. Longitudinal research is needed to further clarify the role of gender-based processing in sex-role development.

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Contents

List of Figures

List of Tables

List of Appendices

It is well documented that children are aware of sex-role stereotypes (Williams, Bennett, and Best, 1975) and display sex-typed behaviors and preferences at a very early age (Connor and Serbin, 1977; Fagot and Patterson, 1961; Fauls and Smith, 1965; Fein, Johnson, Kosson, Stork and Wasserman, 1975; Fling and Manosevitz, 1972; Nadelman, 1974). While the existence of such preferences and behaviors is undisputed among investigators in the area of sex-role development, the process by which such phenomena are initiated and maintained remains an active area of research.

The Role of Environmental Factors

Much research has been conducted to investigate the role that the environment plays in fostering sex-role development. Such investigations have resulted in a great deal of evidence attesting to the existence of abundant sources of sex-role information in our society, both in the form of adult modeling of sex-typed attitudes and behaviors and in the form of reinforcement contingencies in the home and school environments that could serve to foster sex-role conformity. Adults have been found to describe the appearance and behavior of their newborn infants in a sex-sterotypic manner (Rubin, Provenzano and Luria, 1974), to judge certain toys as more appropriate for two-year-old

boys than two-year-old girls (Fagot, 1973) and to offer different toys to a toddler depending upon whether the child has been labeled a boy or a girl (Seavey, Katz and Zalk, 1975; Smith and Lloyd, 1978; Frisch, 1977). Studies eliciting self report data on childrearing practices reveal that parents expect their children to engage in those behaviors considered appropriate for their own sex (Hoffman, 1977; Sears, Maccoby and Levin, 1957). In addition, observational studies suggest that parents react to their infants and preschool children in ways that could foster sex-typed toy choices and behaviors (Fagot, 1978; Moss, 1967; Parke and O'Leary, 1976; Thoman, Leiderman and Olson, 1972). Evidence also exists suggesting that teachers (Serbin, O'Leary, Kent and Tonick, 1973) and the mass media (Sternglanz and Serbin, 1974; Tedesco, 1974) communicate sex-role expectations and standards to young children.

Such environmental influences may, indeed, have an impact upon the extent to which children adopt sex-typed behavior patterns. For example, Bianchi and Bakeman, (1978) found that children in an open classroom which fostered a relatively egalitarian philosophy were more likely to play in mixed sex groups than were children in a more traditional classroom. This finding is supported by controlled studies demonstrating that

certain sex-typed behavior patterns such as play with same-sex peers (Serbin, Tonick and Sternglanz, 1977) and dependence (Serbin, Connor and Citron, 1978) can be rapidly reduced by systematically modifying reinforcement contingencies in the classroom. Such evidence appears to further implicate environmental influences as being important in the process of sex-role development.

Evidence for the Importance of Cognitive Factors

At first glance, this research might lead to the conclusion that environmental modeling and/or reinforcement of sex-typed attitudes and behavior patterns are a necessary and sufficient condition for sex-role development. However, evidence concerning the rigidity with which children adhere to sex-role attitudes and behaviors, even when presented with information that is inconsistent with traditional stereotypes, is difficult to explain on the basis of environmental influences alone, and has caused most theorists to acknowledge the role played by cognitive factors in sex-role acquisition.

Studies attempting to modify sex-typed behaviors in the preschool classroom have revealed that removal of experimental contingencies typically results in a rapid and complete return of childrens' social and play behavior to baseline levels (Serbin,

Tonick and Sternglanz, 1977; Serbin, Connor and Citron, 1978). Several other researchers have noted the extreme rigidity that characterizes the sex-role attitudes and behaviors of preschool children. Levin (1981) discusses anecdotal material suggesting that young children may adopt sex-role attitudes that are far more restrictive and rigid than those displayed within their families. For example, she discusses an incident in which a young girl insisted upon choosing a boy to fill the role of doctor in her play activities, in spite of the fact that her own mother was a physician. In addition, a study conducted by Papalia and Tennant (1975) revealed that the occupational aspirations of preschoolers often do not involve choices that are modeled within the child's family but rather, seem to represent extreme caricatures of the roles of men and women. Boys chose to be firemen, policemen, astronauts and cowboys while girls chose to be mothers, nurses, ballerinas, baton twirlers, and princesses. A more recent study by O'Keefe and Hyde (1983) employing preschoolers through sixth graders revealed similar findings, with the occupations chosen most frequently by girls being nurse, teacher, and mother and those chosen most frequently by boys being truck driver, fireman, and farmer. Further support for rigidity in young childrens' sex-role

attitudes was provided by Cordua, McGraw and Drabman (1979) in a study investigating recall of films portraying adults in either sterotypic or counter-stereotypic occupations. Whereas 100% of children were able to correctly recall the roles played by the characters in a film depicting a male doctor and a female nurse, only 50% displayed accurate recall following a film of a male doctor and a male nurse, and only 22% correctly recalled a film of a female doctor and a male nurse. These data suggest that young children may incorrectly encode or inefficiently store information that runs counter to sex-role expectations.

Thus, childrens' sex-role attitudes and behaviors, rather than being an accurate portrayal of the contingencies and information available in the environment, appear to represent an extremely rigid caricature of existing sex-role norms. Although some might argue that this rigidity is merely the result of exposure to a society in which the overall norms strongly advocate adherence to sex-role appropriate standards, evidence of fairly regular developmental patterns in such rigidity poses difficulty for any formulation that relies solely upon environmental factors. Such evidence suggests that the child's cognitions and way of viewing the world at various ages may have an important influence on the course of sex-role acquisition.

Garrett, Ein and Tremaine (1977) found that stereotypes concerning adult occupations decreased with age in a sample of first, third and fifth grade children. While first graders tended to rate the occupations by using either the extreme masculine or feminine poles on a five-point scale, older children were more likely to employ points in the middle range, displaying a belief that both males and females were capable of performing the various occupations. These authors clearly demonstrated that first graders were able to effectively use the entire scale in answering concrete questions and thus, it is likely that the use of extreme points to indicate their attitudes reflects a tendency to form rigid and extreme cognitive categories concerning sex-role behaviors. Several other researchers investigating children's sex-role attitudes concerning occupations have corroborated this pattern of increased flexibility with age (Umstot, 1980; Bacon and Lerner, 1975; O'Keefe and Hyde, 1983; Carter and Patterson, 1982). In addition, sex-role attitudes concerning more general traits have displayed similar developmental patterns (Marantz and Mansfield, 1977; Meyer, 1980).

Finally, Ullian (1976), in a descriptive study involving interviews with 70 males and females between the ages of six and

eighteen, found that six-year-olds viewed behavioral and attitudinal differences between males and females as due to innate physical characteristics and considered deviations to constitute violations of the laws of physical reality. However, by the age of eight, children regarded many aspects of masculinity and feminity to be the result of training and habit and felt that each individual should choose from a wide range of behaviors.

The idea that the cognitive development of young children may play a large role in determining their sex-role attitudes and behaviors is also supported by studies that have investigated relationships between parental and child indices of sex typing within a developmental framework. Marantz and Mansfield (1977) found maternal employment to be negatively related to stereotyped attitudes concerning activities and traits in a group of girls between the ages of seven and eight. However, no such relationship was obtained in their sample of five and six-year-olds. In addition, Meyer (1981), in a study on the relationship between the sex-role attitudes of girls between the ages of six and twelve and those of their mothers, found that correlations within the older age group were of significantly greater magnitude than those obtained within the younger age

group, in spite of the fact that the internal consistency of the measures was comparable across age. Finally, a study conducted by McGhee and Frueh (1980) investigating the relationship between television watching and sex-role stereotypes yielded data that are consistent with these findings. While these investigators found that children who varied in degree of television viewing did display differential developmental trends in their endorsement of stereotyped traits, the data for the girls revealed that this tendency was evidenced only between the ages of nine and twelve. Girls between the ages of six and eight did not display differential sex-role attitudes as a function of amount of television watched.

Although the absence of measures of cognitive development in such studies preclude firm conclusions, these results are consistent with the idea that the cognitive characteristics of young children cause them to rigidly adhere to sex-role stereotypes and to be relatively uninfluenced by counter-stereotyped information. The thinking of older children may involve a more flexible cognitive style that enables them to be influenced by environmental information, some of which may be counterstereotyped. Evidence of such developmental patterns in sex-role rigidity combined with an increasing appreciation of the

role played by cognitive processes in the interpretation of environmental information, have caused most theorists to acknowledge the probable importance of cognitive development in the acquisition of sex-role attitudes and behaviors.

Cognitive-Developmental Theory

Although the importance of cognitive factors is, by now, recognized by most theorists in the area of sex-role development, the nature of this cognitive influence has been much disputed. Kohlberg (1966), the first to put forth a major theory of sex-role acquisition in which cognitive factors were stressed, suggested that the child's understanding of gender progresses in an invariant sequence that is determined by his/her passage through the universal stages of cognitive development proposed by Piaget. Knowledge of gender constancy, an awareness that one's gender is unaffected by superficial transformations in hair, dress and behavior, was proposed as the final stage in the development of gender identity, initiated by the attainment of concrete operations. Kohlberg suggested that it is at this stage, when a stable concept of gender has developed, that the child begins to display sex-typed attitudes, preferences and behaviors, because of a natural tendency to value that which is seen as similar to the self and a motivation to behave in ways

that are consistent with one's gender identity.

Research evidence does, indeed, support the existence of an age-related progression in the understanding of gender, with the ability to correctly label one's own sex and that of others (gender identity), knowledge of the invariance of gender over time (gender stability) and knowledge of the unchangeability of gender in spite of superficial transformations (gender constancy) occurring in sequence (DeVries, 1971; Thompson, 1975; Slaby and Frey, 1975; Marcus and Overton, 1978). However, since gender constancy attainment, as proposed by Kohlberg, occurs during the stage of concrete operations, somewhere between the ages of six and eight, the hypothesis that such knowledge will serve as an organizer of sex-role attitudes and behaviors has long been recognized as invalid. Such an hypothesis contradicts the widespread evidence that children begin to display sex-typed attitudes and behaviors during the preschool years.

This inconsistency has led many cognitive-developmental theorists to propose that only a rudimentary understanding of gender (e.g. the ability to correctly label the gender of oneself and others) is necessary to motivate children to adopt sex-typed preferences, attitudes and behavior patterns. In fact, certain theorists (e.g. Marcus and Overton, 1978) propose that children

who have achieved the concept of gender constancy may actually be less likely to rigidly adhere to sex-typed attitudes and behaviors, for they understand that these are not necessary to preserve their sexual identity. These theorists suggest that it is before the achievement of a full understanding of gender constancy that children are particularly motivated to seek out sex-role information and engage in sex-typed behaviors because it is at this stage that the adoption of opposite-sex behaviors is likely to be regarded as a major threat to gender identity. This viewpoint is certainly consistent with the previously cited studies in which children's sex-typed attitudes were found to become more flexible during the stage at which a full understanding of the unchangeability of gender would be expected to occur. Thus, some of the more recent formulations of cognitive-developmental theory would predict a positive relationship between gender knowledge and sex typing only in samples consisting of children who have not yet achieved a full understanding of gender constancy.

However, it is difficult to reach any definitive conclusion concerning the relationship between the child's level of gender knowledge and his/her tendency to adopt sex-typed preferences, attitudes and behaviors as the available research in this area is

fraught with inconsistency. While some investigations have found a positive relationship between stage of gender constancy and indices of sex typing (Kuhn, Nash, and Brucken, 1978; Gold and Berger, 1978), others have obtained equivocal (Slaby and Frey, 1975: Ruble, Balaban and Cooper, 1979) or negative results (Katz and Rank, 1981; Marcus and Overton, 1978).

It appears that much of this inconsistency may be due to difficulties associated with the accurate assessment of level of gender understanding. Neither of the two measures typically employed to assess gender constancy seem to enable an accurate distinction between those children who have achieved this concept and those who have not. One of these procedures requires the child to state the sex of a pictured figure or doll both before and after the experimenter makes superficial opposite-sex transformations in its clothing and/or hair. Use of this measure (Emmerich, Goldman, Kirsch and Sharabany, 1977; Emmerich, 1981) has yielded a puzzling developmental pattern in which children between the ages of five and six make fewer constancy responses than either their younger or older peers. As it is unlikely that children achieve the concept of gender constancy and then "lose" it later in development, these results suggest that three, five, and seven-year-old children have different interpretations of the

questions contained in this measure and consequently, their responses, even when apparently identical, vary in their meaning and significance. Thus, while the actual responses of three-year-olds on this measure suggest that they are more knowledgeable than five-year-olds, it is likely that their constancy judgments are based upon some immature response tendency or inaccurate interpretation of the question and are unrelated to any cognitive awareness of the unchangeability of gender. Thus, the constancy judgments yielded by this measure may not be an accurate reflection of level of gender knowledge, possibly leading to variability across those studies in which it has been employed.

A second procedure often employed to assess children's stage of gender constancy involves the use of a verbal questionnaire developed by Slaby and Frey (1975). On this measure, children are classified into one of four stages of gender constancy attainment, based upon their responses to fourteen verbal questions. Children are considered to have achieved stage four (i.e. full attainment of gender constancy) when they are able to correctly state what gender they would be if they wore the clothing of the opposite sex and engaged in opposite sex games, and whether or not they could change their sex if they so

desired. One of the major difficulties with this measure is that many children are able to respond correctly to all of the items quite early, often by the age of five, and such accurate responding is not related to performance on a conservation task (Marcus and Overton, 1978). This stands in contrast to the previously described measure, which yielded perfect constancy scores from only 24% of the seven-year-old children studied. Thus, it appears that constancy responses on the Slaby and Frey measure are also difficult to interpret, sometimes representing a true understanding of the unchangeability of gender (i.e. knowledge that people cannot change their sex because of physical constancy) and sometimes merely reflecting an awareness of social convention (i.e. knowledge that people do not usually change their sex). Inconsistent results across studies employing this measure may be due to variations in the percentage of perfect scores that reflect a true understanding of the unchangeability of gender. Based upon the previously discussed predictions of certain recent cognitive developmental theorists, it might be expected that samples in which stage four children have a fairly complete understanding of gender constancy might yield either no correlation or a negative correlation between level of knowledge and sex typing whereas samples in which most of the stage four

children are merely responding on the basis of social convention might yield positive correlations, as even those subjects obtaining the highest scores would consider sex-role behaviors as necessary to maintain their gender identity.

Aside from the equivocal results obtained from investigations attempting to elucidate the relationship between indices of sex typing and gender constancy, the traditional cognitive-developmental approach to sex-role acquisition has been criticized for its emphasis upon an invariant sequence that is fully determined by the child's level of cognitive maturity and that does not require any input from the environment. For example, Bem (1981) argues that cognitive-developmental theory does not adequately address the issue of why gender becomes a relatively more important aspect of the self concept for children than do other characteristics such as religious affiliation or race. Although cognitive-developmental theory has suggested that childrens' emphasis upon gender is due to the perceptual salience of physical differences between the sexes, Bem argues that this alone does not provide an adequate explanation as, in certain cultures, the physical differences between males and females are far less dramatic than the differences between various social castes or religious groups. In spite of this relative lack of

perceptual salience, children in other cultures do appear to develop a strong sense of gender identity. Bem attributes this to environmental influences and suggests that a comprehensive theory of sex-role development must acknowledge the operation and importance of both cognitive and environmental factors.

Lewis and Weinraub (1979) similarly criticized cognitive developmental theory for its tendency to underestimate the importance of environmental factors in sex-role acquisition. These theorists propose that the type of invariant process described by this theory, although often observed in relation to children's understanding of certain physical aspects of their environment, is unlikely to exist in the development of knowledge concerning social characteristics as different environments may vary considerably in the social dimensions they stress and in the traits and behaviors associated with these dimensions. Cognitive-developmental theory's lack of attention to the importance of environmental factors results in an inability to account for the sometimes marked variability that is observed in both quantitative and qualitative aspects of sex-role development among children who are at the same level of cognitive maturity.

Recently, theorists have proposed a model of sex-role development, based upon schema theory, that may have a conceptual

advantage over previous approaches in that it acknowledges the operation and the importance of both cognitive and environmental factors in the acquisition and maintenance of sex-typed attitudes, preferences, and behaviors (Bem, 1981, 1984; Constantinople, 1979; Lewis and Weinraub, 1979; Martin and Halverson, 1982). An understanding of this model requires some discussion of cognitive schemas in terms of their function and their effect upon the way in which we process and interpret the information in our environment.

Schema Theory

Schema theory proposes that individuals have a natural tendency to categorize objects and people into groups or types that are associated with a network of characteristics, and that these cognitive categories, or schemas, help us to structure and make sense of the vast array of information with which our environments confront us. It is also proposed that certain of these schemas or cognitive categories may become relevant to the self, thus providing a way of understanding and conceptualizing our own behaviors, attitudes, and preferences. While schema theory assigns a central role to the way in which the individual's cognitions and manner of information processing affect his/her perception of the environment, it also suggests

that the network of knowledge associated with each cognitive category as well as the relative availability or salience of certain categories over others are determined in large part by information obtained from the environment.

This theory proposes that the formation of cognitive schemas is often adaptive, as it decreases the load on our memory and perceptual systems by allowing us to view each new object or person, not as a completely new entity about which an infinite amount of information must be obtained, but as a member of an already defined larger class. To the extent that the network of stored information associated with these cognitive categories accurately reflects reality, schemas can enable us to make correct inferences about objects and people based upon only limited information. Thus, for example, schema theory would propose that a person seeing only the backrest of a chair due to the presence of a large desk in front of it, would be able to infer the existence of four legs and a seat, even if he/she had never seen that particular chair before, because of his/her schema or accumulated network of knowledge associated with the label "chair".

In addition, this theory proposes that our assignment of a new person or object to a particular cognitive category will

facilitate our ability to learn and remember those facts about the person or object that are consistent with the stored information associated with that category. Thus, for example, once we have labeled a person as shy, this theory suggests that our memory for schema-consistent information about the person would be facilitated, such as the fact that he/she does not like parties.

Schema theory proposes, however, that the interpretation of new information on the basis of such cognitive categories has a major disadvantage as it results in the loss or distortion of information that deviates from the general case (i.e. schema inconsistent information). It is proposed that, in certain instances, when provided with only a limited amount of information, schematic processing may cause us to attribute inaccurate characteristics to a new object or person. Thus, for example, if the previously mentioned chair were of a modern variety that does not have four legs, the schema-based assumption would have resulted in an inaccurate evaluation. The danger of inaccurately attributing certain general chracteristics to a particular case becomes particularly problematic in the domain of social categories as humans typically exhibit a greater degree of individual variation and inconsistency than do aspects of the

physical world.

Schema theory also suggests that schematic processing may cause a loss of schema inconsistent information through a failure to encode and/or retrieve it from memory as well as a distortion of this information such that it conforms to the stored expectations associated with the relevant cognitive category. Thus, for example, a person having an elaborate network of associations to the characteristic "shy", who labels another individual as possessing this trait, might inaccurately encode or recall the person's statement that he likes to go to parties, automatically and unconsciously transforming it into a dislike for parties, thus confirming the individual's schema concerning the behaviors associated with shyness. Thus, it is proposed that once formed, cognitive schemas are extremely rigid structures that are often impervious to contradictory evidence and are thus, self perpetuating.

Research conducted by cognitive psychologists on the learning and memory of nonsocial information such as word lists (Bousfield and Cohen 1953) and perceptual patterns (Posner and Keele, 1968; Franks and Bransford, 1971) reveals that people do, indeed, attempt to actively organize information by means of such cognitive categories or schemata. In addition, more recent

investigations conducted by personality and social psychologists have resulted in an accumulating body of evidence attesting to the operation of such cognitive structures in the processing of information relevant to other people and the self. Several studies have demonstrated that people form cognitive categories representing personality types and that these categories affect the processing of social information in a manner consistent with the predictions of schema theory. For example, Markus (1977) found that subjects whose ratings on a self report questionnaire indicated that they were either highly independent or highly dependent more readily acknowledged those aspects of the self that were consistent with that particular personality trait than those that were not, as demonstrated by a reaction time task. There is also evidence that people form schemas corresponding to various social roles such as occupation. Cohen (1981), for example, discovered that people have rather elaborate associations to the occupations of "waitress" and "librarian" and that their recall of presented facts about individuals who are so labeled is affected by these categories such that schema consistent information is remembered more accurately than schema inconsistent information.

Schema Theory as Applied to Sex-Role Development

Those who have applied concepts derived from schema theory to the area of sex-role development suggest that the initial acquisition of sex-typed attitudes, preferences, and behaviors, as well as their developmental course, may be viewed as a natural consequence of children's innate and often adaptive tendency to form cognitive categories in order to enable them to organize, interpret, and remember the vast array of new information with which they are constantly being presented. These theorists propose that the categories of male and female are particularly likely to become relatively available or salient for young children because of the fact that gender is an attribute that can typically be ascertained on the basis of obvious and concrete physical characteristics, because our society provides a rich network of gender-specific associations in terms of objects, activities, behaviors, attitudes, and personality characteristics, and finally, because of what Bem (1981) describes as "society's ubiquitous insistence on the functional importance of the gender dichotomy" (p. 355).

As cognitive schema produce a readiness to process and assimilate information in terms of the relevant category labels, it is proposed that the salience of gender as a categorization dimension facilitates the child's tendency to notice and learn

the network of characteristics associated with each sex within our society. Thus, this formulation suggests an underlying process that could account for the early and fairly rapid attainment of sex-role knowledge in virtually all young children. In addition, because of the characteristics of schematic information processing described previously, combined with the fact that preoperational children tend to form particularly rigid cognitive categories, such a formulation could help to explain the young child's tendency to emphasize differences between the sexes and to be resistant to incorporating information that runs counter to traditional stereotypes. Such theorists (e.g. Bem, 1981; Martin and Halverson, 1981) have suggested that children's self identity becomes incorporated into the appropriate gender category, thus providing an internal motivation for them to adopt sex-typed preferences and attitudes and to engage in sex-typed behaviors. Once such attitudes and preferences emerge, it is also likely that environmental reinforcement serves to further strengthen and maintain them.

This model assigns a major role to the way in which the child's cognitions shape his/her perception of the environment and is, in fact, quite consistent with Kohlberg's formulation in its assertion that the cognitive tendency to sort individuals

into male and female categories underlies sex-role development. However, unlike traditional cognitive-developmental theory, this formulation suggests that the environment plays a major role in determining the dimensions along which children categorize, the relative salience of those dimensions, and the characteristics that are associated with each of the cognitive categories. Thus, while such a formulation might lead to the prediction that gender would be a relatively salient dimension for most young children in our society, it does acknowledge the possibility that certain children, because of a particularly egalitarian upbringing, might be less likely to structure their experience on the basis of this dimension. Given the voluminous evidence attesting to the operation of both cognitive and environmental influences in sex-role development, the current formulation appears to offer a conceptual advantage over previous models that have focused almost exclusively upon only one of these factors. In addition, this approach, because of its emphasis upon categorization, lends itself to the use of a wide range of relatively indirect and nonverbal assessment techniques (e.g. matching, sorting, and reaction time tasks), many of which would be suitable for use with young children. This is a methodological consideration that is particularly crucial when investigating the earliest stages of

sex-role development, as empirical evidence suggests that behavioral indications of sex typing often emerge by the second or third year.

Evidence of Gender-Based Schematic Processing in Adults and Children

Recent investigations conducted with adults suggest that people do, in fact, structure and process information about others as well as the self by means of cognitive gender categories and that this tendency is most pronounced in sex-typed individuals. For example, it has been found that sex-typed adults have a greater tendency to cluster words on the basis of gender-related associations on a free recall task than do cross-sex-typed, androgynous or undifferentiated subjects (Bem, 1981), are faster in acknowledging schema consistent (i.e. sex-typed) information about themselves and slower in acknowledging schema inconsistent information on a reaction time task than are other subjects (Bem, 1981; Markus, Crane, Bernstein and Siladi, 1982), and display greater recall of information that is consistent with the schema for their own sex than of information that is inconsistent with this schema (Markus, et. al, 1982).

There is also some evidence that cognitive gender categories

exist in children and affect the way in which they process information. Kail and Levine (1976), in a study assessing memory for word pairs in children between the ages of seven and ten, found that switching the type of words to be remembered from those with a feminine connotation to those with a masculine connotation or vice versa resulted in a release from proactive inhibition (i.e. improved memory) in sex-typed subjects, suggesting that for these children, masculine and feminine words are perceived as belonging to separate conceptual categories.

Results of studies on children's memory for traditional versus nontraditional sex-role information suggest that these gender-based cognitive categories do result in the facilitation of recall for schema consistent information that is predicted by schema theory. Thus, Liben and Signorella (1980), in a study employing first and second grade subjects, found that sex-typed children showed greater memory for pictures depicting individuals engaged in sex-appropriate activities than for pictures depicting individuals engaged in nontraditional activities. However, this result was obtained only when the actor was male. Stronger evidence for this effect was obtained by Koblinsky, Cruse and Sugawara (1978) in a study assessing the memory of fifth grade children for the sex-role traditional and nontraditional

behaviors and traits of male and female characters that were portrayed in a story. Children in this study displayed greater recognition memory for traditional descriptions than for nontraditional descriptions, regardless of sex of the character.

These findings could be interpreted as reflecting a response bias, whereby children, having little or no memory of story content, provided guesses based upon their knowledge of traditional sex-role stereotypes. However, these investigators note that such a response bias should result in almost perfect "recognition" of stereotypic items and almost no "recognition" of counter-stereotypic items. The obtained mean memory scores did not support this pattern, revealing much higher recognition of counter-stereotyped items and lower recognition of stereotypic items than would be expected if the results had been largely determined by such a response bias. Rather, it does appear that children's prior sex-role expectations result in the processing of information in a manner that facilitates memory for stereotypic material.

In addition to increased memory for schema consistent as opposed to schema inconsistent information, studies conducted with children have revealed that the distortions of information predicted by schema theory also occur. Liben and Signorella

(1980) found that false recognition of pictures involving actors engaged in sex-appropriate activities occurred with greater frequency than false recognition of nontraditional pictures, regardless of the child's degree of sex typing. Once again, however, this only occurred for pictures involving male actors. In addition, Martin and Halverson (1983) provided support for the idea that young children resist the incorporation of counter-stereotyped material by translating it into schema consistent information. These investigators found that the five and six-year-olds they studied, regardless of degree of sex typing, had a greater tendency to reverse the sex of the actor when recalling pictures involving an individual engaged in a nontraditional activity (e.g. a woman hammering) than when recalling pictures involving traditional sex-role information (e.g. a woman ironing).

Once again, it could be argued that such results merely reflect a stereotypic response bias whereby children answer on the basis of their sex-role knowledge as opposed to their actual memory of the information presented. These investigators suggest that certain aspects of the instructions to subjects were specifically designed to prevent such a response bias. That is, it was emphasized to children that they should try to recall the

presented pictures and when they could not, they should state an inability to remember as opposed to guessing. In addition, children's ratings of their degree of confidence in their answers revealed that they were as certain of their reversals of counter-stereotypic pictures as they were of their accurate responses; a result that would not be expected if subjects felt they were guessing on such items.

Thus, research evidence with adults as well as children does, in fact, suggest that gender-based schematic processing occurs and may be an important cognitive mechanism underlying the maintenance of sex-typed attitudes and behaviors. It is also possible that this tendency to categorize information on the basis of gender as opposed to other dimensions may be a process important in the early acquisition of sex typing. However, as even the youngest children employed in these studies were well beyond the age at which the process of sex-role acquisition is initiated, little is known about the early development of this tendency to use gender as a way of organizing information or about whether age-related patterns in such gender-based processing underlie the early acquisition and course of various indices of sex typing.

Purpose and Hypotheses of the Present Investigation

A major aim of the present study was to develop a measure suitable for use with children between the ages of three and seven to assess the tendency to categorize information on the basis of gender as opposed to other available dimensions so as to enable an examination of the developmental course of this phenomenon in relation to age-related patterns in more traditional measures of sex-role acquisition. The measure that was developed is comprised of twelve items, each of which requires the child to perform a matching task using colored photographs of people engaging in various activities. The items are constructed such that the child is able to match the photographs either on the basis of gender or on the basis of some other cue such as activity or facial expression, thus enabling an examination of the frequency with which gender is employed over other dimensions when organizing and incorporating new information.

In order to examine age-related patterns in gender-based processing in relation to the development of other aspects of sex typing, a sample of children between the ages of three and seven was administered this measure of gender-based classification as well as instruments assessing several more traditional aspects of sex-role development, including knowledge of traditional

stereotypes concerning the roles and behaviors of men and women, flexibility of attitudes in relation to these stereotypes, preferences for same-sex peers and sex-typed toys, and actual adoption of sex-typed play patterns in the home.

Based upon the findings of previous investigations, it was expected that sex-role knowledge as well as preferences for sex-typed play activities and same-sex peers would increase with age, while children's attitudes concerning such stereotypes would become more flexible with age. As the previously described theory suggests that the process of classifying information on the basis of gender initiates and facilitates the learning of sex-role information, it was expected that gender-based classification would be highest at the younger ages and would be apparent prior to early increases in sex-role knowledge. In addition, it was expected that a decrease in gender-based classification would underlie the increased flexibility of attitudes that was predicted to occur at the older ages. That is, it was expected that older children would be less likely than younger children to rigidly sort information into male and female categories and that this would enable the adoption of more flexible attitudes regarding the roles of men and women. As it was felt that sufficient emphasis is placed upon the gender

dichotomy, even within the most egalitarian of households, to communicate to children that this is an important dimension along which to sort information, it was expected that gender-based categorization would be determined, in large part, by developmental patterns in the child's natural cognitive tendency to sort people and objects into dichotomous groups. Thus, it was expected that scores on this measure might reveal only limited individual differences between children within a particular age group.

How can the predicted decrease in gender-based classification be explained at a theoretical level? Martin and Halverson (1981) have suggested that children's developing ability to form cognitive categories that are more differentiated and less rigid during the stage of concrete operations may play a role in this process. These theorists propose that the predominance of gender as a classification category decreases with the emergence of new and diversified sorting dimensions (e.g. intelligence, interests, athletic ability, etc.). There is, indeed, some evidence (Peevers and Secord, 1973) that use of role categories to describe people is most common in preoperational children whereas with age, there is greater use of descriptors that capture the person's uniqueness and describe the

individual in a more sharply differentiated way.

However, the child's increasing cognitive ability to form such diversified categories does not, in itself, explain why these new schemas become more salient or available than the gender dimension when incorporating new information. If it is assumed that the young child is innately motivated to learn as much as he/she can about the world, then it might be argued that cognitive categories would be particularly salient at the point when the labels for these categories are first learned and the many characteristics associated with these labels are not yet known. A decrease in the salience of these categories might be expected, then, once the relevant characteristics have been mastered.

Thus, it may be that the child, having learned the category labels of "boy" and "girl" and of his/her membership in one of these categories, becomes particularly motivated to acquire information concerning the toys, activities, behaviors, and clothing that are associated with each of these labels and thus, diligently sorts information along the gender dimension. However, it is possible that once these labels and their associated networks of characteristics are learned, the salience of this dimension decreases somewhat in favor of newly developed

schemas because of the fact that these new cognitive categories provide novel information about the social world and the self.

Another possible reason for such a decrease in gender-based categorization may involve the child's understanding of the conservation of form and the concommitant realization of the unchangeability of gender. That is, it is possible that categorizing behaviors and activities as "for boys" or "for girls" decreases in importance once the child realizes that such characteristics do not determine one's gender identity. Thus, two possible mechanisms have been suggested to account for the predicted age-related decrease in gender-based classification, one stressing the role played by the child's degree of knowledge concerning traditional sex-role stereotypes, and the other emphasizing the importance of the attainment of gender constancy. In order to evaluate the evidence for each of these hypotheses, the present study examined the relationship between gender-based classification and both sex-role knowledge and gender understanding.

Although the tendency to classify new information about others along the gender dimension may decline with age, it has been proposed (Martin and Halverson, 1981) that the cognitive categories of male and female and their associated

characteristics continue to be salient for certain individuals in particular situations. It is proposed here that, for certain children, gender may remain a particularly salient dimension in situations involving personal choices and decisions, even though it is no longer employed to organize information about others when additional categorization dimensions are available. This is analogous to the case of a physical dimension such as color which becomes less dominant for purposes of classifying objects as the child matures and begins to employ more developmentally advanced categorization dimensions such as size, shape, and function, but may remain an important factor in determining personal preference for certain objects in some children.

Thus, in addition to assessing children's use of the gender dimension in classifying new information about others, it was decided to examine age-related patterns in the degree to which this dimension is employed to make personal choices when other cues are available upon which to make such decisions. This was investigated by administering a measure specifically developed to assess the degree to which the child makes affiliation choices on the basis of gender as opposed to other available cues. The procedure employed in this measure was similar to that involved in the assessment of gender-based classification so as to enable

an unconfounded comparison between the salience of gender for categorizing others and for making decisions regarding the self. Thus, on each of the five items contained in the measure of gender-based affiliation preference, colored photographs of adults were presented in a manner such that the child was forced to make his/her decision on the basis of gender or on the basis of some other specific nongender cue.

As it was anticipated that home environments might differ in the degree to which they encourage the use of these gender categories in the making of personal decisions concerning behaviors and activities, it was expected that this measure would yield greater individual differences than that of gender-based categorization. In addition, it was hypothesized that children's tendency to employ the gender dimension as opposed to other available cues when making personal choices would underlie and thus, be related to, scores on traditional measures of sex-typed preference. Finally, it was expected that gender-based affiliation choices would be made by children thoughout the age range studied and would not display the type of developmental decrease anticipated in the case of gender-based categorization.

In order to more directly compare the salience of gender for classifying new information and for making personal decisions in

terms of the relative influence of cognitive maturity and environmental factors, questionnaires were administered to parents assessing the degree to which they model and reinforce sex-typed attitudes and behaviors. These questionnaires solicited information concerning parental reactions to their children's sex-typed play and behavior patterns as well as the degree to which parental occupational involvement and division of household responsibilities conforms to traditional sex-role expectations. It was expected that degree of gender-based classification would be more strongly related to mental age than to family variables whereas gender-based affiliation choices would be determined largely by environmental factors.

Another major aim of this study was to attempt to clarify the previously mentioned finding that relationships between parent and child indices of sex typing vary as a function of the age of the child. While the results of these studies suggest the operation of some type of cognitive processing in young children that causes them to be fairly impervious to environmental influences, the absence of cognitive measures in these investigations has prevented firm conclusions. A possible alternative explanation is that older children's attitudes and preferences are more similar to those of their parents because of

their longer period of exposure to parental models. Thus, in the present investigation, an attempt was made to determine whether the previously obtained findings were due to chronological age, per se, or whether they were the result of differences in cognitive processing that occur with age. It was predicted that children's degree of gender-based categorization would play an important role in moderating the relationship between parent and child indices of sex typing, even when the effects of age were controlled. More specifically, it was expected that children who have a tendency to rigidly categorize new information into male and female categories would be relatively impervious to any egalitarian attitudes or behaviors modeled within the home environment and thus, would display a level of sex typing unrelated to that of their parents. However, those children who are less likely to organize new information on the basis of a rigid gender-based classification system were expected to be more receptive to the full range of information provided by parents concerning sex typing, including both egalitarian and traditional messages, and would be more likely to display a level of sex typing consistent with that of their parents.

It was predicted that the degree to which children make affiliation choices based upon gender might also play some role

in moderating the relationship between parental and child indices of sex typing. It was hypothesized that children with a tendency to make affiliation choices on the basis of gender might be more likely to seek out the company and attention of the preferred-sex parent relative to the non-preferred sex parent and thus, might have more of an opportunity to notice, learn, and adopt the behaviors and attitudes of the former than children who do not tend to make gender-based affiliation choices. Of course, even children who tend to affiliate on the basis of gender are exposed frequently to the non-preferred sex in a wide variety of contexts and thus, it was expected that this process might play only a minor role, if any, in moderating the relationship between parental and child indices of sex typing. In contrast, the measure of gender-based categorization, which was designed to assess a generalized cognitive process affecting the child's perception of all new information in a fairly pervasive way, was expected to play a stronger and more important role in moderating this relationship.

Thus, in summary, the aim of the present study was to examine age-related patterns and individual differences in children's tendency to employ gender when categorizing new information about others and when making personal choices for the

self in an attempt to elucidate the role played by gender-based processing in the acquisition and development of sex-typed knowledge, attitudes, preferences, and behaviors. In addition, an attempt was made to determine whether this cognitive tendency to categorize information along the gender dimension affects the degree to which children are receptive to and influenced by the actual information regarding sex-role stereotyping that is available in their home environments.

Summary of Hypotheses

In summary, it was expected that:

1) sex-role knowledge and sex-typed preferences for play activities and same-sex peers would increase with age,

2) childrens' attitudes in relation to sex-role stereotypes would become more flexible with age,

3) the tendency to categorize new information on the basis of gender (i.e. the frequency of gender-based classification responses) would be greatest at the younger ages and would be apparent prior to early increases in sex-role knowledge,

4) a decrease in gender-based classification would underlie the increased flexibility of attitudes that was predicted to occur at the older ages,

5) gender-based categorization would be determined, in large part, by developmental patterns in the child's natural cognitive tendency to sort people and objects into dichotomous groups, and would reveal only limited individual differences between children within a particular age group,

6) the tendency to use gender as a dimension along which to make personal affiliation choices would not decline with age,

7) the tendency to make gender-based affiliation choices would be related to the extent to which the home environment encourages reliance upon this dimension when making personal decisions,

8) gender-based affiliation choices would be related to scores on traditional measures of sex-typed preference,

9) children's degree of gender-based categorization would play an important role in moderating the relationship between parent and child indices of sex typing, with the sex typing scores of children low in gender-based categorization being most related to those of their parents,

10) gender-based affiliation might, to a limited degree, also moderate the relationship between parent and child indices of sex typing due to a tendency for children scoring high on this measure to seek out the company of and possibly imitate the behaviors of the parent of the preferred sex to a greater extent

than their peers.

In addition, analyses were conducted in order to determine whether the predicted decrease in gender-based classification occurs 1) because the cognitive categories of male and female no longer provide new and useful information for the child once basic knowledge concerning sex-role stereotypes is acquired or 2) because of the child's attainment of the concept of gender constancy and the concommitant realization that knowledge and adoption of the behaviors and traits traditionally associated with each sex are not necessary in order to maintain one's gender identity.

Method

Subjects. To obtain a sample of boys and girls between the ages of three and seven, children were recruited from a community preschool attended by three to six-year-olds (N = 129) and a private elementary school comprised of children between the ages of four and eight (with 93 children being seven years or younger), both of which were located in a large Canadian city. Children attending the elementary school were primarily from upper middle class homes and had varied ethnic and religious backgrounds. The preschool sample consisted almost exclusively of Jewish families whose socioeconomic status ranged from lower middle to upper middle class.

As the age range of children attending these two schools differed, siblings and friends of participating children were recruited in an attempt to equalize sample sizes from the two populations at each age level. Although 185 children were initially tested, 38 were eventually eliminated for reasons that will be reported subsequently. The 147 subjects that were included in the study consisted of 50 children attending the elementary school (representing 54% of the three to seven-year-olds in this sample) as well as 6 of their siblings

and 24 of their friends, and 43 children attending the preschool (representing 33% of the three to seven-year-olds in this sample) as well as 12 of their siblings and 12 of their friends. In the final sample, each of the five age groups contained either fourteen or fifteen children of each sex. A breakdown of the number of boys and girls at each age level obtained from the various sources is displayed in Appendix I.

Measures of Gender-Based Processing. These measures were developed in order to determine the degree to which gender is a salient or important cue to children. (See Appendix II for a description of measure development, piloting, and reliability). One of these measures assesses the frequency with which children categorize new pictorial information on the basis of gender as opposed to other available cues while the other assesses the degree to which they make affiliation choices on the basis of gender when other relevant dimensions are available.

The portion of the measure that assesses the child's tendency to categorize information on the basis of gender consists of twelve items. On these items, the child is required to perform a matching task using colored photographs of adult males and females who are engaged in various activities. A description of each of these twelve items can be found in

Appendix III. In each item, the child is handed a photograph of an individual engaging in some activity and is asked to place this standard on top of the one it "goes with" from a series of three additional photographs. The child is given the choice of matching the standard (e.g. a man who is cooking) to a photograph of a same-sex individual who is engaging in a different activity (e.g. a man who is reading), to a photograph of an opposite-sex individual who is engaging in the same activity (e.g. a woman cooking), or to a photograph which is not similar to the standard either in terms of gender or activity (e.g. a woman reading). The first response would be considered to reflect categorization on the basis of gender and the second would be considered to reflect a match on the basis of activity or "prop". The third type of response would be interpreted as reflecting either a random choice or a choice based upon idiosyncratic characteristics. Children receive scores on this measure that reflect the total number of responses made on the basis of gender.

It was felt that children who chose the random response at a level equal to or greater than that which would be expected by chance (i.e. four or more of such responses out of twelve) either did not understand the task instructions or were inattentive and

uninvolved. Since inclusion of such subjects would add unexplained variance, thus decreasing the likelihood of obtaining a true picture of the development of gender-based classification, children who responded in this random fashion on more than three of the items were eliminated from the study. The data of three children (one three-year-old and two four-year-olds) were excluded from further analyses on the basis of this criterion.

In order to make certain that sex responses on the classification portion of the measure were made because of the salience of the gender dimension rather than because of the child's inability to match on the basis of prop or activity, a series of six items were administered to assess the child's ability to match on the prop/activity dimension. The format of these items was identical to that of the matching items except that all individuals in a particular item were of the same sex. Thus, the only correct response on such items involved a match on the basis of prop. A description of the content of these six prop awareness items is presented in Appendix IV. Item number 6 was eventually eliminated as it was responded to incorrectly by 20% of the children due to certain similarities between the clothing of the standard and of one of the possible choices. Children who responded correctly on less than three of the prop

awareness items were eliminated from the study. Twenty-four children (11 three-year-olds, 6 four-year-olds, 4 five-year-olds, 3 six-year-olds) were eliminated on the basis of these criteria.

The measure assessing the relative use of the gender dimension when making affiliation choices consists of five items in which children are asked to choose one person, from three individuals depicted in colored photographs, with whom they would most like to engage in a particular activity. The questions posed to the child as well as descriptions of the possible responses on these items are presented in Appendix V. Children are given the option of either choosing an individual who is not of the preferred sex but is engaging in an interesting activity, an individual who is of the preferred sex who is not engaging in an interesting activity, or a person who possesses neither of these desirable characteristics. These would be considered to be responses based upon activity, gender and idiosyncratic cues, respectively.

As can be seen in Appendix V, two forms of these items were constructed, one for use with children having a female preference and the other for those having a male preference. In order to determine such preferences, a series of eight picture pairs were presented, each of which depicted a male and female engaged in

identical activities. In each item, children were required to choose the individual with whom they would most like to play. Children were considered to prefer the sex which they chose on a majority of responses. Children who made an equal number of male and female responses were, for the purposes of assigning a form of the affiliation measure, considered to prefer individuals of their own sex. Use of these items revealed that 64 out of the 74 boys and 64 out of the 72 girls displayed a same-sex preference, whereas the remaining childrens' responses indicated a preference for affiliation with the opposite sex. An examination of Appendix VI, depicting boys' and girls' responses to each of the eight gender preference items, reveals that each item elicits the expected preference for affiliation with same-sex individuals, but displays sufficient variability within each sex to assess individual differences.

As a result of information obtained during the piloting of this measure, it was decided not to eliminate children from the investigation because of "random" responses on the affiliation items. In contrast to the classification measure, which yielded very few random responses, even at the earliest stages of piloting, random choices in response to the affiliation items were relatively frequent, and remained so, despite various

manipulations in the salience of the two relevant dimensions. Thus, in spite of the fact that the types of choices the child is faced with were quite similar across these two measures, many children who responded in a nonrandom fashion on the classification items were found to make random choices on the affiliation items. Thus, "random" choices on the affiliation measure did not seem to be rare and aberrant responses given by inattentive subjects, but appeared to reflect a real tendency on the part of children to frequently make affiliation choices on the basis of some idiosyncratic characteristic. Verbal statements made by children while engaging in this task supported the idea that subjects often provided a random response, not because they were inattentive, but because they were attracted to certain characteristics of the random choice (e.g. "I like this one because he has a beard like my daddy"). Thus, children were not eliminated on the basis of the frequency of such responses and all subjects received a score on this measure reflecting the total number of choices made on the basis of gender.

Assessment of Children's Sex-Role Knowledge and Flexibility. A portion of the Sex Role Learning Index (SERLI), developed by Edelbrock and Sugawara (1978), was administered in order to assess children's knowledge of the activities and behaviors

traditionally associated with the male and female sex role as well as the flexibility of their attitudes concerning such stereotypes. This portion of the SERLI contains 20 drawings of objects, ten of which are typically associated with the male sex role (e.g. hammer, shovel, baseball, stethescope, police officer's badge) and ten of which are typically associated with the female sex role (e.g. iron, needles and thread, broom, baby bottle, brush and mirror). In order to obtain a measure of flexibility, children are shown the pictures one at a time and are asked to state whether each object is for boys, for girls or for both boys and girls. For example, the experimenter might say, "This is a picture of a desk. Who do you think would use this desk to be a teacher? Boys, girls, or both boys and girls?". The order of the verbal alternatives offered by the experimenter is alternated during testing. Following this verbal response, the child is asked to place the picture into one of three boxes. One of these boxes has a picture of a boy and a girl on it, a second has a picture of two boys on it, and the third has a picture of two girls on it, signifying that the activity is for both boys and girls, just for boys, or just for girls, respectively.

The number of "both" responses made by a child on this task

was considered to reflect the degree to which his/her attitudes concerning traditional sex-role norms were flexible or rigid, with high scores indicating greater flexibility. Although Edelbrock and Sugawara (1978) neither use this score nor refer to it as a measure of flexibility, the procedures by which it is obtained are, in fact, quite similar to those reported in the previously cited studies investigating developmental patterns in the flexibility of children's sex-role attitudes involving occupations.

In order to obtain a measure of the child's knowledge of traditional stereotypes, the "both" box is removed, and children are readministered the items contained in that box in forced choice format, being asked to state whether each is more typical of boys or girls. In readministering these items, the experimenter says, for example, "I know you said these things are for both boys and girls, but who do you think would use a desk to be a teacher more, boys or girls?". Children receive two scores on this measure, one reflecting knowledge of stereotypes associated with their own sex and the other reflecting knowledge of stereotypes associated with the opposite sex. Both of these scores are expressed as a percentage of the total number of responses that conform to traditional sex-role stereotypes. As

these two scores were found to be moderately correlated ($r(144) = .50$, $p < .001$) in the present sample, it was decided, for purposes of this study, to employ only the overall percentage of correct responses.

Edelbrock and Sugawara (1978) found the test-retest reliability of childrens' own sex-role knowledge to be .69 and of opposite sex-role knowledge to be .65 over a three week period within a sample of 119 preschoolers. In addition, it was reported that this measure displayed the expected age-related pattern, with older children obtaining significantly higher scores than younger children.

Assessment of Children's Sex-Typed Preferences and Behaviors. The second portion of the SERLI was administered in order to provide an assessment of children's preferences for sex-typed activities. This portion of the measure assesses children's preferences for various child and adult activities by employing a series of 20 pictures, each of which depicts either a child or an adult engaging in one of the activities presented in the sex-role knowledge task. Separate forms of this task are presented to boys and girls, with boys being shown pictures of males and girls being shown pictures of females. In the child figures portion, a series of ten pictures are laid out in random

fashion, five of which depict a same-sex child engaging in a sex-typed activity and five of which depict a same-sex child engaging in an activity traditionally considered more typical for the opposite sex. The experimenter points to and names each item and then asks, "If you could do any one of these things, which one would you like to do best?". The child's response is recorded, the picture is removed from the array, and the procedure is repeated until all of the items are removed. In order to assess sex-typed preferences for adult activities, the same procedure is used except that either adult women or men are depicted engaging in various activities, and the experimenter asks the child, "which one of these things would you like to do or be when you grow up?".

A major advantage of this measure is that the child's score is based upon a table of probabilities provided by the authors which lists all possible orders in which the sex-appropriate items can be chosen and the likelihood of each. This system is extremely sensitive to the order of the child's choices. For example, a child who makes three sex-appropriate responses followed by a sex-inappropriate choice would receive a higher sex-typed preference score than a child who makes a sex-appropriate choice, followed by a sex-inappropriate and two

sex-appropriate choices. Possible scores on this measure range from 20 to 80, with higher scores reflecting greater preference for sex-typed activities.

As would be expected of a measure assessing children's preference for sex-typed activities, data collected by Edelbrock and Sugawara (1978) reveal that scores on this portion of the SERLI increase with age between three and six, and are higher for boys than for girls. Although test-retest reliability was not significant for scores on the child figures portion of this measure when an opposite- sex experimenter was employed ($r(18) = .43$, ns.), these scores were reliable with a same-sex experimenter ($r(18) = .90$, $p < .001$), and the adult figures section was found to be reliable across both same ($r(18) = .84$, $p < .001$) and opposite sex experimenters ($r(18) = .57$, $p < .05$). Finally, boys' scores on the It Scale were found to be significantly related to their scores on both the child ($r(39) = .41$, $p < .01$) and adult figures sections ($r(39) = .39$, $p < .01$) of the sex-role preference measure, even when the effects of age were controlled. Although the sex-role preference measure was not significantly related to the It Scale for the girls, it is possible that this is due to the perception of the It figure as a boy, resulting in a greater number of masculine choices than

would have been made by these girls if they had responded on the basis of their own preferences.

One shortcoming of the SERLI is that it does not include many of the play activities that have been repeatedly demonstrated in the literature to be preferred by either boys (e.g. blocks, building toys, climbing and riding toys) or girls (e.g. dolls) and which appear to be predictive of some of the cognitive and behavioral differences between the sexes. Thus, it was decided to include the DeLucia Toy Choice Procedure (DeLucia, 1963) as an additional measure of sex-typed activity preferences. This measure contains 22 forced choice items in which children are presented with two pictures of toys and are required to choose the one they would most like to play with. All of the toys used in this measure were previously rated by adults on a 7-point scale, ranging from "masculine" to "feminine", with a neutral midpoint. The measure consists of three types of toy pairings that are based upon these ratings: a toy rated on the masculine end of the scale paired with a toy rated on the feminine end of the scale, two toys rated at different points on the masculine end of the scale, and two toys rated at different points on the feminine end of the scale. Thus, while the two toys on some of the items vary widely in sex typing, the

distinction between others is more subtle. Each item, however, contains one toy that is considered to be a relatively "feminine" choice and one toy that is considered to be a relatively "masculine" choice. The child is given a score on this measure reflecting the number of choices that are "sex-appropriate" according to traditional standards.

Delucia's (1963) original article described the use of a projective technique in which children were asked to make choices for a same-sex child. This procedure was abandoned in favor of a more direct approach in which children are asked to make choices for themselves. This modification was instituted for it was felt that use of the projective technique yields ambiguous results as it may be that only some children project their own preferences when making choices for the same-sex figure whereas others interpret the intructions to mean that they are to choose toys that a "typical" same-sex child would like. Children interpreting the intructions in this latter way would be responding largely on the basis of their knowledge of traditional sex-role stereotypes as opposed to their own sex-typed preferences. The use of a more direct approach, in which children are asked to make choices for themselves, certainly does not completely eliminate the possibility that responses, in addition to reflecting personal

preferences, will be influenced by knowledge of traditional stereotypes and anticipation of the types of choices that would be approved of by adults. However, it was felt that use of less ambiguous instructions would at least reduce variability across subjects in terms of the way they consciously interpret the task requirements.

Although this measure does have certain weaknesses, most notably the pairing of toys that differed by only a few tenths of a point on the adult sex typing ratings, Serbin and Sprafkin (1982) did find that it correlated significantly with boys' sex-typed play as assessed by both a five-minute laboratory behavior sample ($r(16) = .47$, $p < .05$) and a classroom observation procedure conducted over a four-week-period ($r(19) = .38$, $p < .05$).

Given that children's stated toy preferences under laboratory conditions are not necessarily an accurate reflection of their toy choices under more natural circumstances, it was decided to obtain parent reports of their children's frequency of play with various toys in the home. In order to obtain this information, a list of 29 toys was constructed, 17 of which were considered to be male-preferred and 12 of which were considered to be female-preferred. The selection of toys in each of these

categories was based upon previous research demonstrating an observed difference in the frequency with which boys and girls play with certain toys (Fagot and Patterson, 1969; Rubin, 1977; Connor and Serbin, 1977; Etaugh, Collins and Gerson, 1975; Fagot and Littman, 1976), investigations demonstrating adult perceptions of certain toys and activities as more appropriate for (Fagot, 1973) or typical of (DeLucia, 1963; Connor and Serbin, 1977) one sex than the other, as well as research showing a difference in the types of toys that parents provide for boys and girls (Rheingold and Cook, 1975). A small number of toys were also included which, although not directly investigated in previous research seemed, on the basis of observation, to be preferred by either boys (i.e. chess, microscope, computerized games, star wars characters) or girls (i.e. nurse's kit).

All parents were mailed this list as part of a larger questionnaire that will be described subsequently, and were asked to first indicate which of the toys were available to the child in their home and which were not. Following this, they were asked to rate their child's frequency of play with each of the available toys on a five-point scale ranging from rarely or never to very often (see Appendix VII).

In order to obtain a sex typing score for each child, a

procedure similar to that described by Connor and Serbin (1977) was employed. That is, two scales were developed, one reflecting degree of play with male-preferred toys and one reflecting degree of play with female-preferred toys. To determine which toys were male-preferred and which were female-preferred in this population, a t-test was computed on each toy, comparing the mean frequency of play reported by mothers of boys with that reported by mothers of girls. As the response rate to the questionnaire by fathers was quite low, their data was not included in this or any subsequent analyses. The results of these tests are shown in Appendix VIII.

A toy was included in either the masculine or feminine activity scale if the difference between the mean of boys and girls was in the predicted direction, the probability of obtaining this difference by chance was less than .15, and the toy was available in at least 50% of the homes. Using this procedure, eight toys were found to meet all criteria for inclusion in the male-preferred scale (trucks, cars, trains and airplanes, baseball, construction toys, climbing and riding toys, computerized games, tools, star wars characters, water pistol) and seven of the toys met all criteria for inclusion in the female-preferred scale (telephone, jump rope, painting and

drawing, sewing, kitchen toys, makeup play, dolls and accessories). Two scores were then computed for each child, one reflecting his/her mean frequency of play with toys included in the masculine scale that were available in the home and one reflecting his/her amount of play with available toys on the feminine scale. As would be expected of an instrument that is designed to measure masculine and feminine preferences as independent dimensions rather than as bipolar ends of a single continuum, these two scores were not significantly related to each other ($r(98) = -.15$, ns). In order to obtain a measure for each child indicating the degree to which he/she engages in sex-typed activities relative to activities typically preferred by the opposite sex, scores reflecting opposite-sex play were subtracted from sex-typed play scores. Thus, for boys, the feminine activity score was subtracted from the masculine activity score whereas for the girls, the reverse was done. This procedure is similar to that employed by Bem (1974) in scoring the Bem Sex Role Inventory, in which the difference between endorsement of masculine and feminine personality characteristics is computed so as to yield an "androgyny" score for each subject.

Since same-sex affiliation preferences are considered to be

a major component of sex typing in young children, a measure was also included (Peery, 1979) in order to assess degree of preference for same-sex peers. All participating children who attended either the community preschool or the private elementary school were presented with a board containing individual pictures of each of their classmates, taken a few weeks prior to testing. Each child was asked a series of six questions, three assessing their favorite peers (i.e., "Whom do you like to play with outside?", "Whom do you like to sit next to when the teacher reads a story to the class?", and "When you can do whatever you like to do, whom do you like to do it with?") and three assessing their least favorite peers (i.e., "Whom don't you play with outside?", "Whom don't you sit next to when the teacher reads a story to the class?", and "When you can do whatever you like to do, whom don't you do it with?"). The positive form of each question was immediately followed by its negative counterpart. The child was asked to make three choices for each of the six questions and to respond by pointing to a picture and stating the child's name. After each response was made for a particular question, the photo was removed and the sex of the child chosen was recorded. All photos were replaced on the board at the start of each new question. In the rare case when a peer was

incorrectly named, the child was corrected and asked whether he/she still wanted to pick that child. Eighteen choices were thus obtained from each child, nine in response to positive items and nine in response to negative items.

Children who did not attend either of the schools in which the study was conducted were tested at home and practical considerations made it impossible to obtain individual photographs of their classmates. In these cases, the child was asked if he/she had a current class picture and choices were made by pointing to individuals in the photograph. In 16 out of the 54 sessions conducted at home, it was impossible to administer this measure because a class picture was unavailable and/or the child did not attend school.

As correlations conducted between the two types of responses indicating sex-typed peer choices (i.e. same-sex responses to positive questions and opposite-sex responses to negative questions) revealed a low but significant positive relationship ($r(131) = .31$, $p < .001$) these scores were added to yield a single measure reflecting the degree to which the child makes sex-typed peer affiliation choices. In addition, a low but significant relationship ($r(131) = .27$, $p < .002$) was obtained between the two types of responses indicative of opposite-sex

peer preferences (i.e. opposite-sex responses to positive questions and same-sex responses to negative questions) and thus, these two scores were added to yield a measure of the child's tendency to make nontraditional affiliation choices. A single score was then derived for each child on this measure reflecting his/her tendency to make sex-typed peer choices relative to nontraditional peer choices by subtracting the latter score from the former.

Assessment of Sex Typing in the Home. A questionnaire was mailed to parents in order to assess the degree to which sex-stereotyped attitudes and behaviors are represented in the child's home environment. More specifically, this questionnaire assessed sex typing of parental reactions to the play activities and behaviors displayed by their child, parental modeling of sex-typed behaviors within the home, and degree to which the mother had been involved in employment activities.

In order to assess reactions to sex-typed play activities, parents were presented with the list of male and female stereotyped toys that was previously described, and were asked to rate each of the toys according to what they predicted their reaction would be if that toy was their child's favorite. These ratings were made on a 7-point scale ranging from "extremely

disappointed and concerned" to "extremely pleased" (see Appendix IX.) Once again, only responses of mothers were employed as an insufficient number of questionnaires were returned by fathers to enable inclusion of their data in any meaningful way.

Degree of parental sex typing on this measure was derived in a manner similar to that employed for the questionnaire assessing the child's frequency of play with each of these activities. That is, a t-test was conducted on each toy, comparing the reactions of mothers of boys to the reactions of mothers of girls, in order to determine which of the items were responded to in a sex-typed fashion within this population (i.e. responded to differentially depending upon the sex of the child). The results of these tests are shown in Appendix X.

Once again, a toy was considered to elicit a sex-typed reaction from parents if the difference between the mean reaction of mothers of boys and girls was in the predicted direction and the probability of obtaining this difference by chance was less than .15. However, it was decided not to impose the previously employed criterion that the toy must be available in at least 50% of homes to be included in one of the sex typing scales as it was reasoned that attitudes regarding a particular toy might be communicated to children even if the toy were not available in

the home (e.g. possibly when parent and child view television commercials for that toy or visit a toy store together). Using this procedure, ten of the toys were found to be reacted to more favorably by parents of boys (trucks, cars, trains and airplanes, baseball, checkers or chess, climbing and riding toys, microscope, computerized games, tools, star wars characters, football) and five were reacted to more favorably by parents of girls (dancing, sewing, kichen toys, dolls, nurse's kit). Two scores were then computed for each mother, one reflecting her mean reaction to toys generally considered by this population to be more appropriate for boys and one reflecting her mean reaction to toys considered to be more appropriate for girls. A score reflecting degree of sex typing was then obtained by subtracting her mean reaction to play with opposite-sex toys from her mean reaction to play with same-sex toys.

An additional series of items was constructed in order to assess parental reactions to certain male and female stereotyped behaviors and traits in their children. This portion of the questionnaire is shown in Appendix XI. Each of the behaviors included in this scale was adapted from the Childrens' Personal Attributes Questionnaire (Hall and Halberstadt, 1980), a measure designed to assess the psychological masculinity and femininity

of school aged children, that was based upon the Personal Attributes Questionnaire designed for adults (Spence, Helmreich and Stapp, 1975). The scores of boys and girls on the male and female stereotyped items had been previously found to differ significantly in the predicted direction and parents' ratings of their children on this measure were significantly correlated with children's ratings of themselves.

Twenty behaviors and traits, ten traditionally considered to be feminine and ten considered to be masculine, were rated by parents on a 7-point scale ranging from "I would not like my child to display this trait and it is extremely important to me that he/she does not do so" to "I would like my child to display this trait and it is extremely important to me that he/she do so". An attempt was made to include an equal number of positive and negative behaviors in the masculine and feminine scales.

Once again, a series of t-tests was conducted to determine which behaviors were actually responded to differentially by mothers of boys and mothers of girls within this population (see Appendix XII). However, these tests revealed that reactions to only three out of the 20 behaviors differed significantly as a function of sex and none of these effects were in the predicted direction. Rather, the stereotypically masculine behaviors of

"acting like a leader with peers" and "fighting back when peers become physically aggressive" were reacted to more favorably by parents of girls, and "submitting to the decisions of peers", a stereotypically feminine behavior, was reacted to more favorably by parents of boys. Thus, in general, mothers in this sample did not respond in a stereotyped fashion on this measure and, in fact, showed some evidence of a favorable reaction when their children exhibited certain behaviors traditionally associated with the opposite sex. Although these results are interesting in terms of their implications for a societal movement towards more egalitarian attitudes concerning the roles of males and females, this measure was not considered to be a useful one in terms of assessing individual differences in mothers' degree of sex typing and was not employed in any subsequent analyses.

In order to assess degree of occupational involvement, parents were asked to report on their employment status during various stages of the child's life. This information was obtained by means of the items shown in Appendix XIII. A score reflecting the mother's mean employment status over the course of the child's life was then computed by assigning a score of 0 to periods of unemployment, a score of 1 to periods of part-time employment, and a score of 2 to full-time employment. In

addition, it was felt that the mother's level of employment during the child's first year as well as her current employment status might exert a particular impact upon the child's development. Thus, three scores were initially derived from this portion of the questionnaire. However, mother's mean employment was highly related to both level of employment during the child's first year ($r(93) = .84$, $p < .001$) and to current employment status ($r(93) = .91$, $p < .001$), and current level of employment was moderately correlated with employment level during the child's first year ($r(93) = .66$, $p < .001$). Thus, these variables were combined, by adding the standard scores, to form a single variable reflecting overall degree of maternal employment. Although this variable reflects mothers' mean employment status over the course of the child's life, it gives added weight to her status during the period of time in which the questionnaire was answered and to the year after the child's birth.

Finally, information on parental modeling of sex-typed behaviors and roles within the home was obtained by administering two subscales of the Sex-Role Behavior Scale-2 (SRBS-2, Orlofsky, Ramsden and Cohen, 1982) which assess the division of labor in the family in relation to household responsibilities and child care. This portion of the questionnaire can be seen in Appendix

XIV. The behaviors on these scales had been previously rated by college students on a 5-point scale to compare the typical adult man and woman, with 3 (no difference, equally characteristic) as the midpoint. In addition, students had been asked to rate the desirability of the items for a man and a woman. On the basis of these ratings, items had been assigned to one of three scales: the male-valued scale (containing items rated as more typical of males but equally desirable for both sexes), the female-valued scale (containing items rated as more typical of females but equally desirable for both sexes) and the sex specific scale (containing all items that were rated as more typical of either males or females and more desirable for that particular sex).

Although several of the SRBS-2 scales would have probably yielded interesting information on various aspects of parental sex typing (e.g. division of labor concerning family finances, marital and sexual behavior, aptitudes and interests), it was felt that the inclusion of such a lengthy questionnaire, containing some rather personal questions might drastically reduce the response rate. Thus, it was decided to include only those scales assessing the division of labor surrounding household chores and child care. It was felt that these two scales contained behaviors that are likely to be most apparent to

young children and thus, might have the greatest impact upon them.

Although Orlofsky (1981) reported that there was low internal consistency for the individual subscales in the original version of the SRBS, a report on the more recent version of this scale states that alpha coefficients were all greater than .70. The items on these subscales are rated on a 5-point scale ranging from much more characteristic of my spouse to much more characteristic of me. Each participating parent received three scores: a female-valued score, a male-valued score, and a sex-specific score. As only mothers' responses were employed due to the low return rate from fathers, this latter scale was scored in a feminine direction. That is, for feminine behaviors on this scale, a score of 1 was assigned to the response "much more characteristic of my spouse" and a score of 5 was assigned to the response " much more characteristic of me". However, for masculine behaviors on this scale, the scoring was reversed such that these responses received ratings of 5 and 1, respectively.

A correlation between the female valued and sex specific scores was conducted in order to determine whether these could be combined to form a composite measure reflecting mothers' degree of involvement in feminine sex-typed behaviors and activities.

This analysis revealed a low but significant positive correlation between these scores ($r(102) = .26$, $p < .009$) and thus, a mean, based upon the standard scores of these two measures, was computed for each mother. Scores on the male valued scale were found to be unrelated to this composite score ($r(102) = -.11$, ns), suggesting that subjects' degree of involvement in "masculine" activities was independent of the extent to which they engaged in feminine sex-typed behaviors. Once again, a procedure similar to that described by Bem (1974) was employed. That is, standard score equivalents on the male valued scale were subtracted from the composite score reflecting frequency of "feminine" activities to yield a measure of mothers' degree of involvement in sex-typed activities relative to those traditionally considered more typical of males.

In summary then, three scores were obtained from the questionnaire, one reflecting sex typing of mothers' reaction to child's play, one reflecting mothers' employment history, and the third representing degree to which mothers' behaviors and activities in the home conform to traditional sex-role expectations.

Procedure. Parents of all children between the ages of three and seven attending either the elementary school or the

preschool were mailed a description of the study and consent forms early in the Fall of 1981. Four weeks later, parents who had not responded were phoned and encouraged to mail their response in, whether it be positive or negative, as soon as possible. Testing at the elementary school was conducted from October to January and testing at the preschool was initiated in February and continued until May. During the month of March, questionnaires were mailed to all parents. Mothers and fathers were encouraged to respond separately. Four weeks later, another copy of the questionnaire was mailed to all parents who had not yet responded. One hundred and two of the children's mothers filled out questionnaires and 22 of these children also had a questionnaire filled out by their father. An additional seven children had questionnaires filled out by their fathers alone. The return rate for these questionnaires was spread out fairly evenly across sex and the five age groups. The distribution is presented in Appendix XV. As the number of questionnaires obtained from fathers was insufficient to conduct the type of analyses needed to address the hypotheses posed by this study, only the responses provided by mothers were used. Out of the 102 questionnaires returned by mothers, 10 had to be eliminated due to missing information or unintelligibility.

Parents who had consented to the participation of an older or younger sibling, not attending either of the schools in which testing was conducted, were called during the month of May to arrange a time for their child to be tested in the home. At the time of testing, these parents were asked for the names and phone numbers of any of their friends, having children between the ages of three and seven, whom they thought might be interested in participating. These referred parents were subsequently phoned by the investigator to describe the study and, in most cases, arrange an appointment.

All children attending either the preschool or elementary school were individually tested on two separate occasions by one of four female experimenters. The two testing sessions for each child were conducted by two different experimenters, in order to prevent the child's familiarity with the tester from affecting scores on measures administered in the second session. Although some experimenters conducted more testing sessions than others, an effort was made to ensure that each tester was assigned an equal number of children at each of the age levels, an equal number of boys and girls, and an equal number of first and second sessions.

It was decided to administer the measures of gender-based

processing early in the first session so that children's responses would not be affected by other questions that might emphasize the gender dimension. However, it was necessary to administer the eight sex preference items prior to the measure assessing gender-based affiliation choices as the child's responses on the former procedure were needed in order to determine the form of the latter measure to be administered. It was decided to give the eight sex preference items first, and to then administer the Peabody Picture Vocabulary Test, the I.Q. measure employed in this study. It was felt that the interjection of this sex-neutral task, which typically takes approximately 10 minutes to administer, would counteract any increase in the salience of the gender dimension caused by the sex preference items. Following the PPVT, the gender-based classification and affiliation items were administered. The last test given during the first session was the Slaby and Frey (1975) gender constancy questionnaire. This session lasted approximately 15 to 20 minutes.

The second testing session was administered approximately three weeks after the first session. At the start of the second session, children were presented with the six prop awareness items. Following this, the sociometric peer choice task and the

SERLI were administered. As described by Edelbrock and Sugawara (1978), the Sex Role Knowledge portion of the SERLI was administered first, followed by the child and adult figures sections. This second session lasted approximately 30 to 35 minutes. Six children attending the preschool were either unwilling to accompany the examiner for the second testing session or were unable to do so because of prolonged absence from school and were eliminated from the study. Children who were tested at home were administered all of the measures in one session, with a 10 minute break between the gender constancy task and the prop awareness items.

In all, 152 children were tested who met all of the criteria and completed the second session. Five were then randomly dropped in order to equalize the number of cases at each age level, resulting in a total sample of 147 children.

Results

Gender-Based Processing: Reliability and Distribution of Responses

An examination of the internal consistency of the two measures of gender-based processing by means of Chronbach's alpha statistic revealed coefficients of .92 and .64 for the classification and affiliation items, respectively. The relatively low internal consistency of the affiliation as compared to the classification measure is similar to the results obtained from the three samples employed for purposes of measure development (see Appendix II). This difference is at least partially attributable to the fact that gender-based affiliation was assessed by means of five items whereas the measure of gender-based categorization contained twelve items. In addition, the anecdotal statements made by children when administered this measure (e.g. "I like this one because he has a beard like my daddy") and the frequency with which these items elicited random responses, suggests that childrens' general tendency to make affiliation choices on the basis of either gender or nongender cues was often superceded by some idiosyncratic feature of one of the individuals depicted in the photographs, thus decreasing the internal consistency of this measure. The matching items, which

required the child, to pick the picture that "goes with" a standard photograph, might have been less susceptible to responses based upon idiosyncratic cues as care was taken during measure development to ensure that the standard presented in each item could not be matched to another picture on the basis of cues other than gender or the particular prop or activity depicted (e.g. presence or absence of a beard, color of clothing, etc.).

Each of the items in the classification and affiliation measures was also examined in order to determine whether they elicited a minimum number of random responses and a reasonable degree of variability between gender and nongender choices in this population. As can be seen in Table 1, random choices constitute between 1% and 4% of the responses for 11 of the 12 classification items, with the remaining item eliciting the random response from 10% of the population. Generally, then, it appears that the task posed by this measure was understandable to this sample of children and that the gender and nongender dimensions were sufficiently clear to be recognized and employed. In addition, none of the items on the classification measure elicited a particular type of response from 90% or more of the population and thus, all satisfactorily meet the criterion, established during measure development, concerning the minimum

Table 1

Frequency and Percentage of Gender, Nongender, and Random Responses on Classification Items

Item Number	Gender Response		Nongender Response		Random Response	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	91	61.9	54	36.7	2	1.4
2	73	49.7	70	47.6	4	2.7
3	39	26.5	105	71.4	3	2.0
4	61	41.5	84	57.1	2	1.4
5	50	34.0	91	61.9	6	4.1
6	53	36.1	90	61.	4	2.7
7	66	44.9	79	53.7	2	1.4
8	42	28.6	90	61.2	15	10.2
9	42	28.6	100	68.0	5	3.4
10	58	39.5	87	59.2	2	1.4
11	42	28.6	101	68.7	4	2.7
12	55	37.4	87	59.2	5	3.4

acceptable degree of variability between gender and nongender responses.

In contrast to the results obtained during measure development, which revealed a disproportionate tendency for children to classify new information on the basis of gender as opposed to nongender cues, data from this sample revealed that the majority of responses to all but two of the items were based upon nongender cues, with ratios of nongender to gender responses on these 10 items ranging between 1.2 to 1 and 2.7 to 1. However, an examination of the distribution of responses to each item within the five age groups revealed that this discrepancy was largely due to the preponderance of nongender responses made by the older children; age groups that were either minimally represented or not represented at all in earlier samples.

An examination of Table 2 reveals that, as in previous samples, the affiliation items elicited a much higher proportion of random responding than did the classification items. Random responding on these items ranged between 12% and 19%. Such choices do not appear to reflect difficulty with the objective salience of the gender and nongender cues, as similar or identical cues were employed in the classification items. Rather, they seem to indicate a real and fairly common tendency

Table 2

Frequency and Percentage of Gender, Nongender and Random Responses on Affiliation Items

Item Number	Gender Response		Nongender Response		Random Response	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	83	56.5	36	24.5	28	19.0
2	70	47.6	52	35.4	25	17.0
3	72	49.0	55	37.4	20	13.6
4	59	40.1	65	44.2	23	15.6
5	67	45.6	62	42.2	18	12.2

for children to base affiliation choices upon idiosyncratic characteristics. As in previous samples, childrens' responses on these items were based, most frequently, upon gender cues and the degree of variability between gender and nongender responses was satisfactory.

Developmental Patterns in Gender-Based Classification and Affiliation

As 24 children were eliminated from the study due to low scores on the prop awareness items, with 71% of these subjects falling within the two youngest age groups, it was necessary, prior to examining developmental patterns, to determine whether this procedure resulted in the selection of three and four-year-olds who were significantly brighter than those children included in the older age groups. This was particularly important as IQ was found to be marginally related to gender-based classification; $r(145) = -.15$, $p < .08$, and significantly related to gender-based affiliation, $r(145) = -.19$, $p < .02$, with brighter children making fewer gender responses on both measures. Thus, the existence of IQ differences across age could potentially affect the developmental patterns obtained for these two measures. A oneway analysis of variance on childrens'

PPVT scores, with age grouping as the independent variable, revealed only a marginal effect of age, $F(4,145) = 2.13$, $p < .08$, with mean IQs for the five groups being 111.03, 101.86, 103.93, 107.67, and 103.83, respectively. Although this effect was only marginal, an attempt was made to covary variability due to IQ in analyses examining developmental patterns in gender-based classification and affiliation. However, these analyses proved to be invalid as they violated the assumption of homogeneity of regression. That is, the relationship between gender-based classification and IQ as well as that between gender-based affiliation and IQ varies as a function of age. Correlations conducted at each age level revealed that gender-based categorization and IQ are significantly related only at age four ($r(29) = -.40$, $p < .03$) and that gender-based affiliation and IQ are significantly related only at age seven ($r(29) = -.55$, $p < .002$). Thus, developmental patterns were examined by means of analyses of variance. Hypotheses concerning the way in which the results may have been affected by employing slightly brighter children in the three-year-old sample will be discussed.

Although the aim had been to recruit subjects from two populations that were sufficiently similar to enable exclusion of this variable from analyses of developmental patterns, a

comparison of the preschool and elementary school samples revealed several differences that could have potentially affected the development of gender-based classification and affiliation. The two populations differed in IQ, $t(144) = 2.21$, $p < .03$, with children from the elementary school scoring significantly higher on the PPVT (Mean IQ = 108) than children from the preschool sample (Mean IQ = 103). In addition, the questionnaire data revealed that mothers of children attending the elementary school had been more involved in employment activities outside the home than had mothers of children attending the preschool program, $t(91) = 2.13$, $p < .04$, and were less stereotyped than mothers of preschool children in terms of their scores on the Sex-Role Behavior Scale, $t(100) = 2.21$, $p < .03$. As a result of these findings, it was decided to include population as a factor in analyses of developmental patterns.

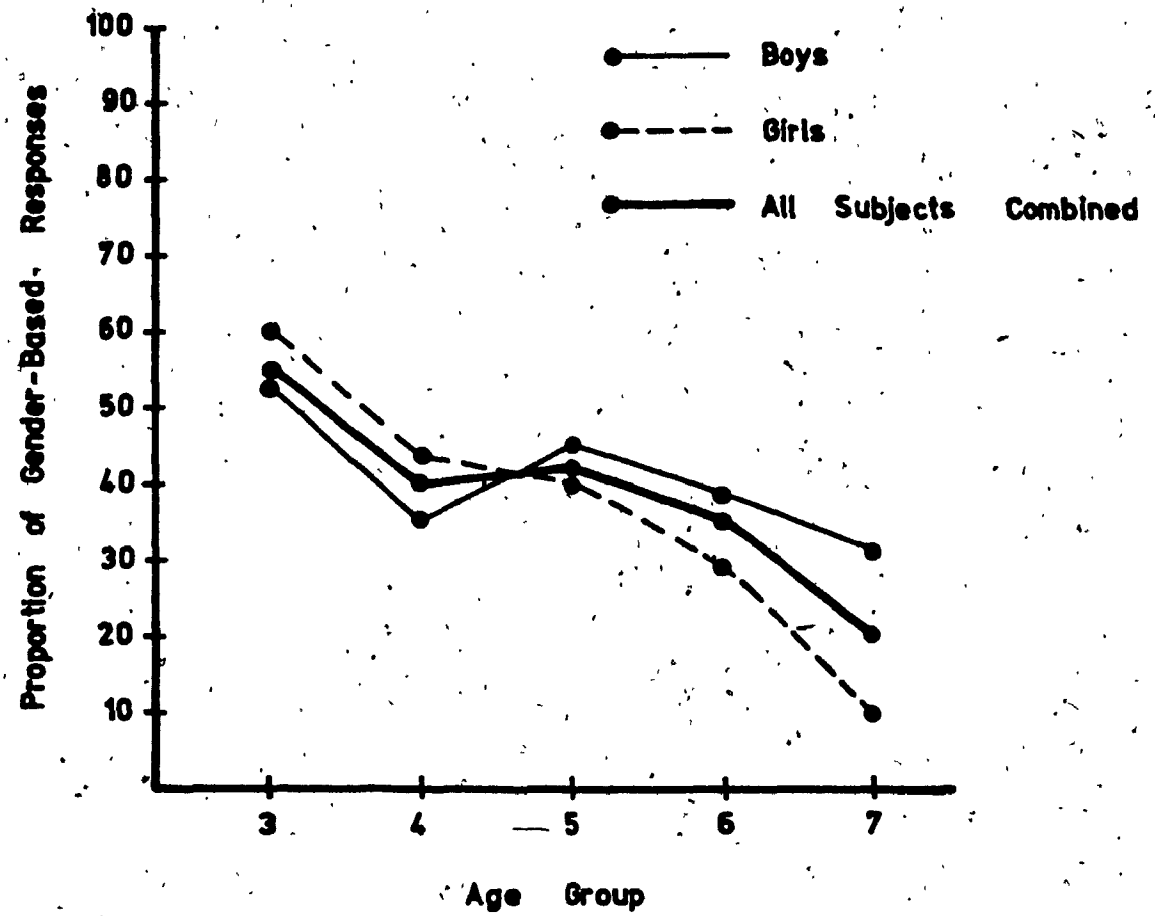
However, as only one girl from the preschool sample had been obtained in the seven-year-old age group, it was not possible to submit all of the data to a three-way analysis of variance with sex, age, and population as the independent factors. In order to avoid complete loss of the data from the seven-year-old children who were tested, it was decided to initially investigate developmental patterns through a Sex by Age analysis of variance,

employing the full age range, and to then determine whether the obtained findings varied across population by means of a Sex X Age X Population analysis conducted on data obtained from children between the ages of three and six.

Separate analyses of variance were conducted in order to examine developmental patterns in gender-based classification and affiliation preference as these two measures were not significantly related, $r(146) = .05$, ns. The two-way (Age X Sex) analysis conducted on the number of gender-based responses made across the 12 classification items revealed a significant effect of Age, $F(4,137) = 4.64$, $p < .002$. As can be seen in Figure 1, gender-based classification choices were highest within the three-year-old age group, comprising 56% of responses, and declined across age. A Tukey test ($p < .05$) revealed that the three-year-olds made significantly more gender-based classification responses than both the six and seven-year-olds, who responded in this manner only 33% and 22% of the time, respectively. Boys and girls did not differ in their degree of gender-based responding on this measure, $F(1,137) = .41$, n.s. In addition, the interaction of Sex and Age was not significant, $F(4,137) = .88$, n.s., demonstrating the stability of the observed developmental pattern across sex. Cell means relevant to this

Figure 1

Developmental Patterns in Gender-Based Classification by Sex



analysis are displayed in Table 3. As the previously reported correlation between IQ and the classification measure reveals that degree of intelligence is negatively related to gender-based responding, the effect of employing slightly brighter three-year-olds in this sample may well have resulted in an underestimate of the degree of gender-based responding in this group.

In order to determine whether the obtained developmental patterns in gender-based classification were consistent across the preschool and elementary school samples, a Sex X Age X Population analysis of variance was conducted, eliminating the 29 seven-year-old subjects. As this analysis revealed no significant interaction between sex and population, $F(1,102) = .85$, ns., it was possible to conduct a two-way analysis of variance, employing only Age and Population as independent variables so as to enable an examination of potential differences in developmental patterns across populations without requiring the elimination of subjects. No significant differences in gender-based responding were found across population, $F(1,137) = 2.76$, $p < .10$. In addition to the overall effect of Age, $F(4,137) = 5.17$, $p < .001$, a significant Age X Population interaction was obtained, $F(4,137) = 4.32$, $p < .003$, indicating

Table 3

Means on Gender Based Classification Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	6.40	7.14	6.76[6,7]
	N	15	14	29
	s.d.	2.50	2.38	2.43
4	Mean	4.33	5.20	4.77
	N	15	15	30
	s.d.	2.69	3.17	2.92
5	Mean	5.27	4.79	5.03
	N	15	14	29
	s.d.	4.56	4.68	4.54
6	Mean	4.27	3.53	3.90[3]
	N	15	15	30
	s.d.	5.44	4.82	5.07
7	Mean	3.67	1.14	2.45[3]
	N	15	14	29
	s.d.	4.53	3.23	4.09
Total	Mean	4.79	4.36	4.58
	N	75	72	147
	s.d.	4.11	4.17	4.13

[a] Superscripts indicate the age groups from which that mean differs significantly.

that the development of gender-based classification varied across the elementary and preschool samples (see Figure 2). Tests of simple main effects revealed that the frequency of gender-based classification responses varied significantly across age in both the elementary school, $F(4,137) = 4.14$, $p < .005$, and preschool samples, $F(4,137) = 4.19$, $p < .005$. However, Tukey tests revealed that the pattern of this age effect was somewhat different across the two groups. In the elementary school population, three-year-olds made significantly more gender-based responses (56%) than did either five (23%) or seven-year-olds (16%). However, in the preschool population, gender-based responding remains high and fairly stable until age six, when it drops to 13%, a level that is significantly lower than that obtained for either the three (56%) or five-year-olds (60%). Thus, as can be seen in Figure 2, the significant drop from initially high levels of gender-based responding occurs at an earlier age in the elementary school population than in the preschool population. Cell means relevant to this analysis are displayed in Table 4. It is interesting to note that, in both populations, the age group immediately subsequent to that displaying the first significant drop in gender responses shows a relatively high level of such responding, a level that does not

Figure 2

Developmental Patterns in Gender-Based Classification by Population

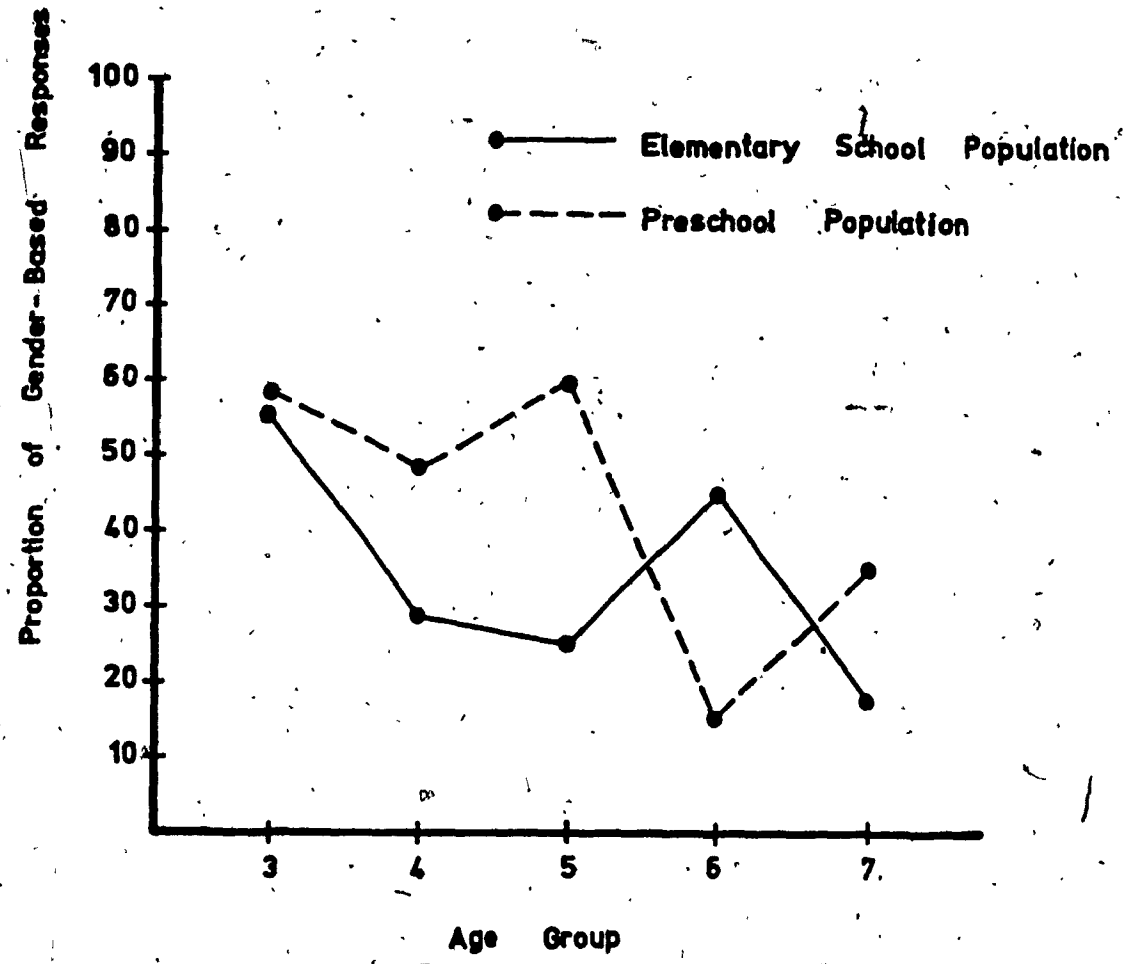


Table 4

Means on Gender-Based Classification Measure Across Age and Population[a]

Age		Elementary School	Preschool
3	Mean	6.75[5,7]	6.76[6]
	N	12	17
	s.d.	2.80	2.22
4	Mean	3.45	5.53
	N	11	19
	s.d.	4.01	1.78
5	Mean	2.71[3]	7.20[6]
	N	14	15
	s.d.	3.75	4.21
6	Mean	5.05	1.60[3,5]
	N	20	10
	s.d.	5.34	3.72
7	Mean	1.91[3]	4.14
	N	22	7
	s.d.	3.64	5.24
Total	Mean	3.80	5.49
	N	79	68
	s.d.	4.36	3.68

[a] Superscripts indicate the age groups within each population from which that mean differs significantly.

differ significantly from the mean obtained within the three-year-old group. That is, six-year-olds in the elementary school ($M = 5.05$) and seven-year-olds in the preschool ($M = 4.14$) both show relatively high levels of gender-based classification, in contrast to the low levels of such responding that were noted at age five in the elementary school ($M = 2.71$) and at age six in the preschool ($M = 1.60$). These findings suggest the possibility that although the use of gender for purposes of categorization does decrease significantly at some point in development, the period following this decrease may be characterized by developmental fluctuations in the importance of this dimension as opposed to a smooth and steady decline.

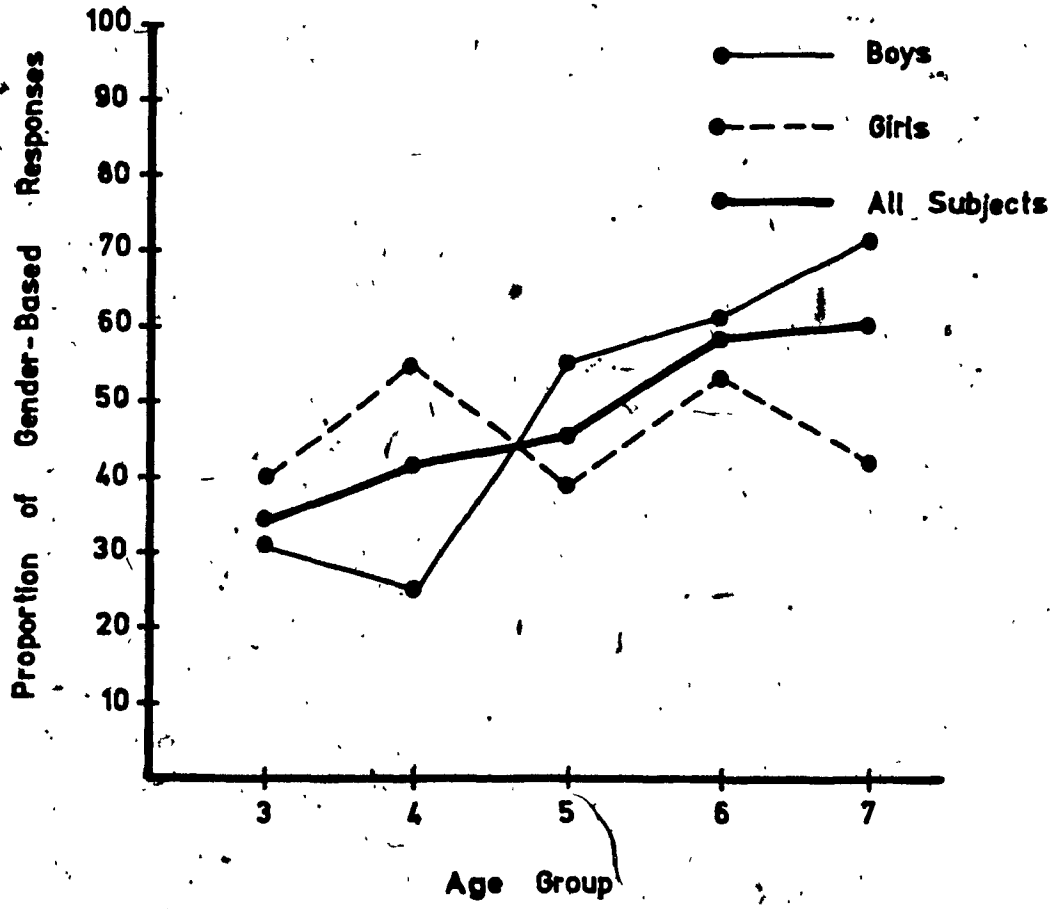
If, as has been hypothesized, gender-based classification is a developmental phenomenon that is determined largely by cognitive maturity, it follows that children who are cognitively advanced would progress through the developmental sequence more rapidly than those who are less bright. Thus, it is possible that the earlier decrease observed in the elementary school population as compared to the preschool population is due to the previously mentioned IQ differences between these two groups. It should be noted, however, that in spite of these differences across population, both groups of children did display the

general pattern of high gender responding at the three-year-old level followed by significant decreases in such responding at some later point in development.

In order to compare developmental patterns in childrens' tendency to classify information on the basis of gender with patterns in gender-based personal preferences, a Sex X Age analysis of variance was conducted on data obtained from the five-item measure assessing childrens' gender-based affiliation choices (see Figure 3). Although this analysis did reveal an overall effect of Age, $F(4,137) = 4.03$, $p < .004$, a significant Sex X Age interaction, $F(4,137) = 4.63$, $p < .002$ was obtained, indicating that boys and girls display different developmental patterns on this measure. Simple F tests conducted for each sex revealed that gender-based affiliation preferences varied significantly across age for boys, $F(4,137) = 7.62$, $p < .001$, but not for girls, $F(4,137) = 1.05$, ns. Tukey tests conducted on the boys' data revealed a pattern of increasing gender-based responses across age, with six (63%) and seven-year-olds (75%) making significantly more affiliation choices on the basis of gender than both three-year-olds (31%) and four-year-olds (25%). Tukey tests also revealed that whereas girls made significantly more gender-based responses than did boys at age 4 (Mean for

Figure 3

Developmental Patterns in Gender-Based Affiliation by Sex



girls = 56%, Mean for boys = 25%), this pattern was reversed within the seven-year-old group (Mean for girls = 44%, Mean for boys = 75%). Cell means relevant to this analysis are displayed in Table 5. A three-way analysis of variance with Sex, Age, and Population as the independent variables, employing children between the ages of three and six, revealed neither overall population differences in gender-based affiliation choices, $F(1,102) = .81$, n.s., nor significant interactions between population and either Age, $F(3,102) = .25$, n.s., or Sex, $F(1,102) = .01$, n.s.

Thus, it appears that the two measures of gender-based processing display very different developmental patterns. Use of gender as a dimension along which to classify information decreases across age. This decreasing pattern is similar for both sexes, a finding that would be expected of an essentially cognitive phenomenon in a sample containing boys and girls whose IQs do not differ significantly. The pattern of differences across the two populations also conforms to that which would be expected of a process influenced largely by cognitive development; that is, while gender-based classification responses decreased across age in both groups, the sample containing higher IQ children showed evidence of this decrease at an earlier

Table 5

Means on Gender-Based Affiliation Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	1.53[6,7]	2.00	1.76
	N	15	14	29
	s.d.	1.06	1.11	1.09
4	Mean	1.27[6,7]	2.80	2.03
	N	15	15	30
	s.d.	1.39	1.42	1.59
5	Mean	2.53	1.93	2.24
	N	15	14	29
	s.d.	1.64	1.54	1.60
6	Mean	3.13[3,4]	2.67	2.90
	N	15	15	30
	s.d.	1.41	1.68	1.54
7	Mean	3.73[3,4]	2.21	3.00
	N	15	14	29
	s.d.	1.53	1.72	1.77
Total	Mean	2.44	2.33	2.39
	N	75	72	147
	s.d.	1.67	1.51	1.59

[a] Superscripts indicate the age groups from which that mean differs significantly.

chronological age. In contrast, the measure assessing gender-based affiliation choices shows a pattern of increasing sex responses across age for the boys, with such responses remaining essentially constant across age for the girls. This sex difference is difficult to explain on the basis of any existing cognitive differences between the boys and girls in this sample, suggesting the possible operation of environmental factors.

An examination of the distribution of gender responses within each age group also suggests important differences between these two measures. As can be seen in Table 6, gender-based classification choices are fairly normally distributed among the three and four-year-olds, with 71% of children within these age groups providing a moderate number of gender-based responses (i.e. between 4 and 8) and only 29% of children providing more extreme scores. However, this pattern changes among the three oldest age groups, in which only 9% of children responded with a moderate number of gender-based choices and 91% provided scores in the more extreme range. Thus, the developmental pattern previously described, involving a decrease in gender-based responding across age, does not reflect a gradual skewing of the distribution towards relatively lower gender responses, but a

Table 6

Distribution of Number of Gender-Based Classification Responses Made by Children at Each Age Level[a]

Number of Gender Choices Made	Age 3	Age 4	Age 5	Age 6	Age 7
0	*	****	***	**********	**********
1		*	********	****	*
2	*	**	**	*	**
3		**	***	***	*
4	*	***			*
5	*****	*******	*		
6	****	***			*
7	******	****	**		
8	******	****	**		*
9	*			*	
10	**		**	*	*
11	**		**	*	*
12		*	****	******	**

[a] Each star represents one child

fairly dramatic shift whereby an increasing number of children respond to all items on the basis of nongender cues. This dramatic shift towards total nongender responding can best be seen by examining the percentage of children exhibiting this type of pattern across the younger and older age groups. Among the three and four-year-olds, only 8% of children made all responses on the basis of nongender cues, whereas 43% of the six-year-olds and 62% of the seven-year-olds responded in this way. Thus, it appears that many of the older children in this sample had completely discarded gender as a basis for classifying new information, suggesting that use of this dimension for such purposes may reflect a specific stage in cognitive development.

In contrast, as can be seen in Table 7, the frequency of children making four or five gender-based affiliation choices increased gradually with age, with no evidence of a dramatic shift towards responding to all items on the basis of gender, in spite of an overall developmental increase in gender-based responses, at least for the boys. Rather, many children within the oldest age group (69%) made at least one of their responses on the basis of a nongender cue.

Table 7

Distribution of Number of Gender-Based Affiliation Responses Made by Children at Each Age Level[a]

Number of Gender Choices Made	Age 3	Age 4	Age 5	Age 6	Age 7
0	***	*****	*****	*	**
1	*********	*******	*****	******	******
2	**********	**********	*******	*****	*****
3	*****	**	*****	********	**
4		**	****	***	*****
5	*	****	***	*******	*********

[a] Each star represents one child

Gender-Based Classification and its Relationship with Sex-Role Knowledge and Flexibility

One of the major hypotheses of this study concerns the developmental relationship between gender-based classification and two cognitive indices of sex-role development: sex-role knowledge and flexibility of sex-role attitudes. As the measures of sex-role knowledge and sex-role flexibility derived from the SERLI were not related to each other ($r(140) = .04$, ns.), two separate Sex X Age analyses of variance were conducted in order to examine developmental patterns. Occasionally, children failed to cooperate on a particular measure, resulting in slight variations in sample size across analyses, as indicated by the degrees of freedom.

As expected, the analysis conducted on the 20-item measure assessing sex-role knowledge revealed a significant main effect of Age, $F(4,134) = 18.20$, $p < .00001$ which, as can be seen in Table 8, revealed that childrens' degree of awareness of the behaviors and activities traditionally associated with males and females increased between the ages of three and seven. A post hoc Tukey test revealed that the increase in percentage of correct responses from age three (Mean = 76.30%) to age four (Mean = 89%) was significant, and represented the only

Table 8

Means on SERLI Sex-Role Knowledge Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	79.62	73.21	76.30[4,5,6,7]
	N	13	14	27
	s.d.	15.61	19.57	17.74
4	Mean	90.67	87.33	89.00
	N	15	15	30
	s.d.	12.56	12.52	12.35
5	Mean	96.67	93.57	95.17
	N	15	14	29
	s.d.	5.56	5.69	5.75
6	Mean	95.33	95.67	95.50
	N	15	15	30
	s.d.	8.34	4.95	6.74
7	Mean	96.43	97.86	97.14
	N	14	14	28
	s.d.	5.35	2.57	4.18
Total	Mean	92.01	89.58	90.73
	N	72	72	144
	s.d.	11.65	13.86	12.82

[a] Superscripts indicate the age groups from which that mean differs significantly.

significant increase between contiguous age groups. This analysis revealed no other significant effects, indicating that the sexes did not differ in their degree of sex-role knowledge, $F(1,134) = 1.92$, ns., nor did the obtained developmental patterns vary across gender, $F(4,134) = .62$, ns.

In order to determine whether these developmental patterns were consistent across population, a Sex X Age X Population analysis of variance was conducted on subjects between the ages of three and six. This analysis revealed no significant interaction between Age and Population, $F(3,100) = .22$,ns., indicating that the obtained developmental patterns were consistent across the preschool and elementary school samples, and only a marginal Population effect, $F(1,100) = 3.04$, $p < .08$, revealing that the elementary school children had a tendency toward higher sex-role knowledge scores than did the preschool sample (elementary school mean = 93.77, preschool mean = 87.39).

In order to examine developmental patterns in sex-role flexibility, a Sex X Age analysis of variance was conducted on the number of "both" responses made on the SERLI (i.e. the number of items, out of a possible 20, on which children responded that both a man and a woman could perform the activity). Once again, a significant Age effect was obtained, $F(4,134) = 3.14$, $p < .02$,

which, as can be seen from the means in Table 9, indicated a pattern of increasing flexibility across age. A post hoc Tukey test revealed that the seven-year-olds displayed significantly greater flexibility in their sex-role attitudes than either the six-year-olds or the three-year-olds. Childrens' scores did not vary across sex, $F(1,134) = 1.27$, ns., nor was there evidence for any difference in the development of sex-role flexibility between boys and girls, $F(4,134) = .26$, ns.

As the obtained age effect was clearly the result of an increase in sex-role flexibility at age seven, it did not make sense to examine the consistency of these findings across the two samples by means of an Age X Sex X Population analysis as this would necessitate the elimination of the seven-year-old group due to the insufficient number of preschool girls at this age. Instead, it was decided to conduct an Age X Population analysis, as this enabled inclusion of data from the seven-year-old group. The findings indicated that the obtained developmental patterns did not differ between the preschool and elementary school samples, $F(4,134) = .54$, ns.

Thus, as predicted, childrens' knowledge of traditional sex-role stereotypes as well as the flexibility of their attitudes regarding these stereotypes increased significantly

Table 9

Means on SERLI Sex-Role Flexibility Measure Across Age and Sex[a,b]

Age		Boys	Girls	Total
3	Mean	4.62	5.50	5.07[7]
	N	13	14	27
	s.d.	2.69	2.68	2.67
4	Mean	5.27	5.60	5.43
	N	15	15	30
	s.d.	3.88	3.46	3.62
5	Mean	5.13	6.64	5.86
	N	15	14	29
	s.d.	4.41	3.41	3.96
6	Mean	4.60	5.13	4.87[7]
	N	15	15	30
	s.d.	2.41	3.04	2.71
7	Mean	7.64	7.50	7.57[3,6]
	N	14	14	28
	s.d.	3.50	2.18	
		2.86		
Total	Mean	5.44	6.06	5.75
	N	72	72	144
	s.d.	3.56	3.04	3.31

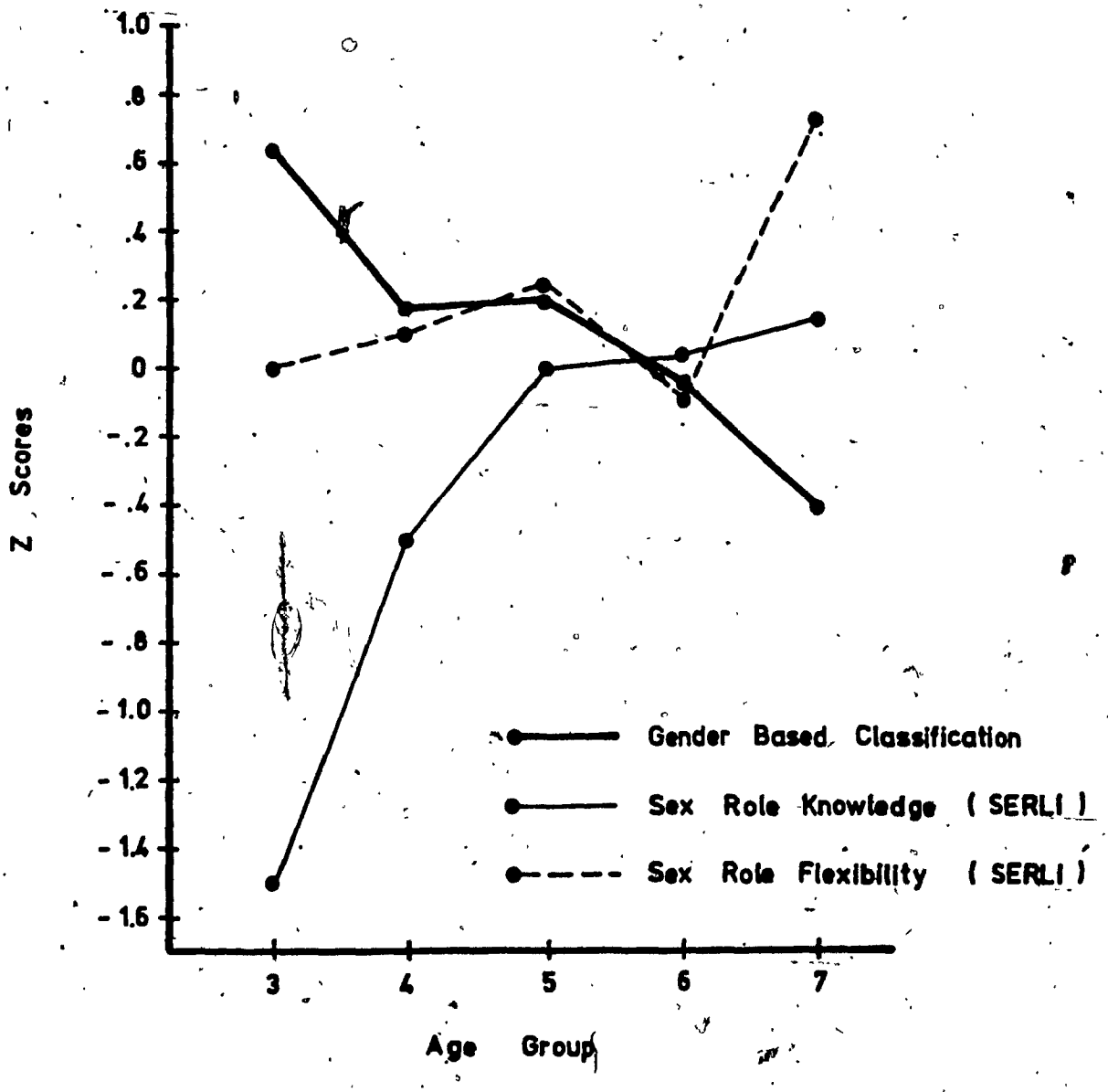
[a] Means reflect mean number of "Both" responses out of a possible 20.

[b] Superscripts indicate the age groups from which that mean differs significantly.

with age. In order to evaluate whether the timing of these developmental increases in sex-role knowledge and flexibility occurred in the predicted manner in terms of their relationship to certain age-related patterns in gender-based classification, scores from these three measures have been plotted in Figure 4. Standard scores have been employed so as to facilitate comparison between measures. As can be seen on the graph, the only significant increase in sex-role knowledge between contiguous age groups (i.e. from age three to four) occurs immediately subsequent to the age at which gender-based classification responses are at their highest (i.e. age three). This confirms the prediction that childrens' tendency to classify information on the basis of gender occurs prior to early increases in sex-role knowledge and is consistent with the idea that gender-based classification may facilitate the child's awareness and acquisition of information concerning the behaviors and activities traditionally associated with males and females in our society. Figure 4 also reveals that the only significant increase in sex-role flexibility between contiguous age groups (i.e. between the ages of six and seven) occurs immediately after the time of the first significant drop (i.e. at age six) in gender-based classification from its initially high level at age

Figure 4

Developmental Patterns in Gender-Based Classification, Sex-Role Knowledge, and Sex-Role Flexibility



three. This supports the hypothesis that children become less rigid in their sex-role attitudes following a developmental decrease in their tendency to categorize new information on the basis of gender.

Aside from examining such developmental patterns, correlations were conducted between gender-based classification and these two cognitive measures of sex-role development in order to determine whether the degree to which children organize new information on the basis of gender is predictive of individual differences in the extent of sex-role knowledge and the degree of flexibility of sex-role attitudes. Earlier, it was hypothesized that use of gender as a dimension along which to classify new information facilitates the acquisition of knowledge concerning traditional sex-role behaviors in our society. In addition, it was predicted that gender-based classification might be employed only as long as it provided useful information regarding such stereotypes and would decrease in frequency once the child had mastered the observable information pertaining to traditional sex-role standards. These hypotheses suggest that the relationship between gender-based classification and sex-role knowledge will differ across age. At the youngest ages, when children are just beginning to learn sex-role stereotypes, even

those with the highest level of knowledge have not yet reached ceiling. Thus, it might be expected that gender-based classification would be positively related to such knowledge within the younger age groups, with those children most inclined to sort their world into male and female categories acquiring the greatest amount of information concerning the content of those categories. At the older ages, when many of the children have attained the ceiling score on the measure of sex-role knowledge, the above hypothesis suggests that a negative relationship with gender-based classification should be obtained. At these ages, children receiving high scores on the SERLI would be expected to classify information on the basis of cues other than gender, as gender-based classification would no longer provide new knowledge about the world.

As can be seen in Table 10, the prediction of a positive relationship between gender-based classification and sex-role knowledge within the youngest age groups was not supported, with no significant correlations obtained between these two measures for the three, four, or five-year-olds. In addition, a Guttman analysis was conducted on data obtained from the 86 children within the three youngest age groups to determine whether there is any evidence that, for individual children, use of gender as a basis for categorization occurs prior to attainment of sex-role knowledge. The hypothesis tested in this analysis was that a child must provide gender-based categorization responses at a

Table 10

Correlations Between Gender-Based Classification, Sex-role Knowledge, and Sex-Role Flexibility

	Age Group					
	3	4	5	6	7	All Subjects
Sex-role knowledge and Gender-based Classification	-.10	-.20	-.03	-.41•	-.49••	-.29••••
Sex-role Flexibility and Gender-based Classification	.02	-.07	-.18	-.23	-.20	-.20•
Sex-role Knowledge and Sex-role Flexibility	-.50•••	-.14	.01	.07	.04	.04
	N=27	N=30	N=29	N=30	N=28	N=144

• $p<.02$

•• $p<.009$

••• $p<.008$

•••• $p<.001$

level at or above the mean score on this measure (i.e. equal to or greater than four responses) prior to achieving an average level of sex-role knowledge (i.e. 90%). This analysis revealed no evidence for such a developmental pattern (coefficient of reproducibility = .74, coefficient of scalability = .24), with five children passing neither criterion, 33 children passing both criterion, and only 26 out of the 48 remaining children who passed one of the criterion displaying the predicted pattern in which high levels of gender-based categorization occur prior to a high level of sex-role knowledge. As many as 22 of the 55 children who achieved above average scores on sex-role knowledge did not obtain high scores on the measure of gender-based categorization.

It may be that only a minimal degree of sorting by gender is required in order to facilitate the acquisiton of sex-role knowledge. As was seen in Table 6, 26 of the three-year-olds are already providing at least 5 responses based upon gender, with only 3 children displaying a lower level of gender classification. If this level of sex responding constitutes a sufficient degree of attention to the gender dimension to enable the child to notice and incorporate the sex-role information that is available in his/her environment, it is not surprising that

the above correlations were not significant as many children who are relatively low in gender-based responding could display high levels of sex-role knowledge. In addition, it is not surprising that this hypothesis was not supported within the four or five year olds as the obtained developmental patterns suggest that children providing less than 5 gender-based responses within these age groups had probably displayed a greater tendency to sort by sex at an earlier age and thus, may have acquired high levels of knowledge as a result of that prior tendency. Examination of an earlier developmental period, when a low level of sorting by gender is displayed by a greater percentage of the children, might enable a more valid test of the hypothesis that gender-based categorization is a necessary precursor to the attainment of sex-role knowledge.

As predicted, a significant negative relationship between gender-based classification and sex-role knowledge was obtained within each of the two oldest age groups. Thus, high levels of sex-role knowledge, which, within these age groups often reflected attainment of an almost perfect score on the SERLI, were associated with low levels of gender-based classification which, as was shown in Table 6, consisted of almost exclusive use of nongender cues for purposes of categorization. In this age

group, higher gender-based classification scores were obtained by children who had not yet reached ceiling on the SERLI measure; that is, by children who had not yet learned about certain aspects of sex-role stereotypes.

Although this correlation is consistent with the proposed hypothesis, it does not demonstrate that, for individual children, one phenomenon precedes the other in the predicted developmental fashion; that is, that a child must have mastered certain basic information regarding sex roles before discontinuing or markedly decreasing his/her reliance upon gender as a means of classification. Thus, a Guttman analysis was performed in order to more directly address this question. The hypothesis tested in this analysis was that a child must attain a score of at least 95% on the sex role knowledge measure (i.e. 19 correct out of a possible 20) before his/her frequency of gender responding on the classification measure drops to a level of three or fewer out of twelve. These criterion were based upon the mean level of performance on these two measures displayed within the oldest age group. That is, it was predicted that a child would not display a level of gender-based categorization below that obtained by the average seven-year-old until his/her knowledge of sex-role stereotypes was greater than that typically

achieved by an average child of that age. The results demonstrated that these phenomena do, indeed, tend to occur in the predicted developmental sequence (coefficient of reproducibility = .95, coefficient of scalability = .76). Out of the 58 six and seven-year-olds studied, 39 had achieved both and six had passed neither of the proposed criterion. Of the remaining thirteen children who had passed only one of the criterion, ten displayed a pattern that was consistent with the hypthesis; that is, they had achieved a high level of sex-role knowledge but had not yet relinquished their use of gender as a dimension along which to categorize information. Only three children out of the 42 who displayed a low frequency of gender-based categorization had not yet achieved a high level of knowledge of sex-role stereotypes.

Analyses exploring the question of whether attainment of sex-role knowledge precedes a decrease in gender-based categorization were initially conducted within the older age groups as it had been anticipated that there might be children within the younger age groups whose low scores on the categorization measure represented an initial awareness of and attention to the gender dimension that would increase over time as opposed to an indication that a previously salient dimension

was decreasing in importance. However, the developmental patterns did not support such an early increase in attention to the gender dimension, possibly because such a phenomenon can only be observed in younger children. Thus, it was decided to perform an additional Guttman analysis, using the entire sample, to test the hypothesis that decreases in gender-based categorization occur only after a high level of sex-role knowledge is achieved. This analysis also supported the hypothesis (coefficient of reproducibility = .92, coefficient of scalability = .80), with 41 children achieving neither criterion, 57 children achieving both criteria, and 34 of the 46 children who had achieved only one of the criterion displaying the expected pattern (i.e. attainment of sex-role knowledge combined with a high level of gender-based categorization). Only twelve out of the 69 children who had achieved the criterion of three or fewer gender-based classification responses had not yet attained a high level of sex-role knowledge. Thus, in general, a child's use of gender as a dimension along which to categorize information does not decrease until he/she has mastered certain basic information regarding the traditional roles of men and women. This finding is consistent with the idea that gender-based categorization is a cognitive process that facilitates the child's attention to and

incorporation of traditional sex-role information and that it is replaced by classification along other dimensions only when it is no longer useful in terms of providing new facts about the roles of men and women.

As can be seen in Table 10, there is a significant overall negative relationship between gender-based classification and flexibility of sex-role attitudes, $r(143) = -.20$, $p < .02$. However, the magnitude of this relationship is quite small and decreases to nonsignificant levels when the effect of age is controlled, $F(143) = -.15$, $p < .09$. Thus, it appears that the significant overall negative relationship between these two variables was due, in large part, to the fact that one increases with age whereas the other decreases with age. An examination of the correlation between these two variables within each age group does not reveal a significant relationship at any point in development.

It is interesting to note that the magnitude of the relationship within the three oldest age groups is similar to that obtained overall, whereas the relationship within the three year old group is close to zero. An examination of the correlation between sex-role knowledge and sex-role flexibility within this youngest age group sheds some light on this finding.

As can be seen in Table 10, there is a fairly strong negative relationship between these two variables within the three-year-old age group, with children who made a high number of "both" responses on the SERLI tending to be those whose level of sex-role knowledge is low relative to their peers. Thus, it appears that within this age group, responses indicating that both men and women can engage in an activity may reflect confusion and lack of knowledge as opposed to true flexibility of attitudes. It is not surprising, then, that this measure shows no relationship with gender-based classification within the lower age groups. However, as stated, the correlations within the three oldest age groups, although in the expected direction, are weak and nonsignificant.

It is possible that the absence of a significant negative correlation among the six and seven-year-olds is due to the minimal degree of variability across children on the measure of gender-based classification at these ages (see Table 6). Given the characteristics of these data, a more appropriate question to address may be whether, for individual children, a decrease in gender-based categorization is a necessary precondition for the attainment of flexible attitudes regarding sex roles. Such a formulation suggests that children at the earliest developmental

stage of this process would display a pattern of high levels of gender-based categorization combined with rigidity of attitudes regarding sex roles, and that children at the most advanced stage would exhibit low levels of gender-based categorization and flexibility of sex-role attitudes. Most importantly, it would be expected that children who are at a transitional stage of development would have attained a low level of gender-based categorization but would not yet have achieved a high degree of attitudinal flexibility. The one pattern that would not be expected on the basis of the proposed formulation is the existence of high levels of attitudinal flexibility combined with a high tendency to categorize along the gender dimension. A Guttman analysis was conducted in which a low level of gender-based categorization was defined as three or fewer sex responses out of twelve and attainment of flexible attitudes was defined as eight or more "both" responses out of twenty. Once again, these criterion correspond to the mean levels of performance displayed by the seven-year-olds on these measures as this is the age period during which the developmental shifts of interest occur. This analysis provided support for the hypothesized progression (coefficient of reproducibility = .93, coefficient of scalability = .78). Out of the 58 children

within these two age groups, twelve had achieved neither and seventeen had attained both of the criteria. Most importantly, 25 of the 29 children who had passed only one of the criterion and thus, can be considered to be at a transitional stage, displayed the expected pattern of low gender-based categorization and low levels of sex-role flexibility. Only four out of the 21 children who displayed flexibility of sex-role attitudes continued to rely upon gender as a dimension along which to categorize information. A Guttman analysis performed on the entire sample of children also provided support for the predicted developmental progression (coefficient of reproducibility = .90, coefficient of scalability = .71). Thus, the results of the analysis performed on older children are consistent with the hypothesis that, in general, individual children tend to decrease their use of gender as a categorization dimension prior to achieving flexible attitudes regarding sex roles.

Gender-Based Classification and Gender Constancy

It had been suggested earlier that one possible reason for the predicted decrease in gender-based classification and increase in flexibility of sex-role attitudes at age seven might

be the reduction in usefulness of the gender dimension over time in terms of providing new information about the world, resulting in movement towards more challenging dimensions. Another proposed reason for this developmental pattern was that children, although initially motivated to learn about the behaviors associated with each of the sexes because of the belief that such superficial characteristics comprise the essence of one's gender identity and are necessary to maintain it, lose their motivation to focus upon this dimension once they realize that gender is an unchangeable attribute. Thus, developmental patterns in childrens' response to the Slaby and Frey gender constancy questionnaire were examined in order to determine if there is any indication that attainment of the understanding that one's gender is unchangeable underlies the decrease in gender-based classification and increase in flexibility of sex-role attitudes that occur at age seven.

A Sex X Age analysis of variance conducted on childrens' Slaby and Frey scores, reflecting level of gender constancy attainment, revealed a significant effect of Age, $F(4,137) = 10.03$, $p < .0001$ which, as can be seen from the means displayed in Table 11, is due to the developmental increase in children's degree of understanding of the concept of gender. A post hoc

Table 11

Means of the Slaby and Frey Gender Constancy Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	2.73	2.64	2.69[4,5,6,7]
	N	15	14	29
	s.d.	1.16	.93	1.04
4	Mean	3.20	3.20	3.20[7]
	N	15	15	30
	s.d.	.56	.77	.66
5	Mean	3.33	3.57	3.45
	N	15	14	29
	s.d.	.49	.51	.51
6	Mean	3.40	3.67	3.54
	N	15	15	30
	s.d.	.51	.49	.51
7	Mean	3.53	3.93	3.72
	N	15	14	29
	s.d.	.64	.27	.53
Total	Mean	3.24	3.40	3.32
	N	75	72	147
	s.d.	.75	.76	.76

[a] Superscripts indicate the age groups from which that mean differs significantly

Tukey test revealed that the three-year-olds obtained significantly lower gender constancy scores than all other age groups and that the four-year-olds were less knowledgeable about the gender concept than the seven-year-olds. However, no significant increase in gender understanding occurred between the ages of six and seven; an increase that might have been expected if gender constancy attainment played a critical role in the decrease in gender-based categorization and increase in flexibility of sex-role attitudes that was found to occur at that time. There was no evidence of a sex difference in degree of gender understanding, $F(1,137) = 2.07$, ns., nor of a difference in age-related patterns across the sexes, $F(4,137) = .64$, ns.

Correlations were also conducted in order to determine whether children's level of understanding of the gender concept was predictive of individual differences in gender-based classification and flexibility of sex-role attitudes. In addition, partial correlations, controlling for the effects of age were conducted, as this variable is significantly related to gender constancy ($r(143) = .44$, $p < .001$) and gender-based classification ($r(139) = -.32$, $p < .001$), and is marginally related to flexibility of sex-role attitudes ($r(139) = .16$, $p < .06$). As can be seen in Table 12, there is a small but

Table 12

Correlations Between Gender Constancy, Gender-based Classification and Flexibility of Sex-role Attitudes

	Zero-order Correlation (N=127)	Age Controlled (N=127)
Gender Constancy and Gender-based Classification	-.20*	-.08
Gender Constancy and Flexibility of Sex-role Attitudes	.06	.00

*$p<.02$

significant negative zero-order relationship between gender understanding and gender-based classification. However, the reduction of this correlation to insignificant levels once the effects of age are controlled reveals that this relationship merely reflects the fact that these two measures display opposite patterns across age, as opposed to indicating that level of gender constancy is predictive of individual differences in children's degree of gender-based categorization within any particular age group. The correlations displayed in Table 12 also reveal that level of gender constancy attainment bears no relation to children's scores on the measure of sex-role flexibility.

Although the analysis of developmental patterns did not reveal a significant increase in gender constancy around the time at which gender-based classification was observed to decline and an increase in flexibility of attitudes regarding sex roles occurred, it is possible that, for individual children, gender constancy attainment does generally precede these other two phenomena and is a necessary, although possibly not a sufficient, precondition for their occurrence. Two Guttman analyses were performed in order to address this question. However, these analyses yielded insignificant results, suggesting that, for

individual children, attaiment of gender constancy, as defined by achieving stage 4 on the Slaby and Frey measure, does not necessarily occur prior to the attainment of low levels of gender-based classification (i.e. 3 or fewer gender responses; coefficient of reproducibility = .80, coefficient of scalability = .56) or to the achievement of high levels of attitudinal flexibility (i.e. 8 or more "both" responses; coefficient of reproducibility = .86, coefficient of scalability = .67). Thus, support was not obtained for the idea that attainment of the concept of gender constancy underlies children's decreased reliance upon gender as a basis for classification and their increased flexibility regarding traditional sex-role stereotypes.

Measures of Sex-Typed Preference: Developmental Patterns and Relationships with Gender-Based Classification and Affiliation

Correlations were conducted among the four measures of sex-typed preference: the SERLI measure assessing degree of preference for sex-typed activities, the DeLucia measure assessing degree of preference for sex-typed toys, the peer choice procedure which measures degree of preference for same-sex peers over opposite-sex peers, and the parent questionnaire measure assessing the degree to which the child plays with

sex-typed toys at home. As can be seen in Table 13, correlations between all possible pairs of sex-typing measures reveal significant relationships, except for that between sex typing of children's play at home and their peer choices within a laboratory setting. However, as neither the peer choice measure nor the parent questionnaire measure were administered to all children, inclusion of these in a multivariate analysis of variance in order to examine developmental patterns would reduce the sample size for the remaining measures, leading to a loss of information. Thus, it was decided to conduct separate univariate analyses of variance on these two measures and to employ a multivariate analysis of variance to examine developmental patterns in the SERLI sex-role preference and DeLucia toy choice measures.

The Sex X Age multivariate analysis conducted on the SERLI and DeLucia revealed a significant effect of Sex (Pillais value = .14655, approximate F = 11.34, $p < 2.87E-005$) with univariate tests indicating that this sex difference occurred on both the SERLI, $F(1,133) = 21.31$, $p<.826E-005$, and the DeLucia, $F(1,133) = 9.34$, $p<.003$. As can be seen in Tables 14 and 15, this effect is due to the higher sex typing scores of boys on both of these measures (SERLI: Boys' mean = 64.30, Girls' mean = 55.81;

Table 13

Correlations Among Measures of Sex-typed Preference

	SERLI Sex-role Preference	DeLucia Toy Choice	Peer Choice	Parent Report of Child's Play at Home
SERLI Sex-role Preference		.56$^{\bullet\bullet\bullet}$ N=146	.23$^{\bullet\bullet}$ N=131	.42$^{\bullet\bullet\bullet}$ N=100
DeLucia Toy Choice			.29$^{\bullet\bullet\bullet}$ N=130	.20$^{\bullet}$ N=102
Peer Choice				.12 N=90
Parent Report of Child's Play at Home				

$^{\bullet}$ $p<.04$

$^{\bullet\bullet}$ $p<.008$

$^{\bullet\bullet\bullet}$ $p<.001$

Table 14

Means on SERLI Sex-Role Preference Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	54.42	47.07	50.61
	N	13	14	27
	s.d.	8.24	7.61	8.62
4	Mean	62.29	50.30	55.92
	N	14	15	29
	s.d.	9.42	9.41	10.92
5	Mean	65.23	55.39	60.48[3]
	N	15	14	29
	s.d.	10.20	15.18	13.57
6	Mean	67.60	61.27	64.43[3,4]
	N	15	15	30
	s.d.	11.91	12.22	12.29
7	Mean	70.93	65.04	67.98[3,4]
	N	14	14	28
	s.d.	8.42	14.26	11.88
Total	Mean	64.30	55.81	60.02
	N	71	72	143
	s.d.	11.02	13.47	12.98

[a] Superscripts indicate the age groups from which that particular mean differs significantly

Table 15

Means on DeLucia Toy Choice Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	13.62	12.14	12.83
	N	13	14	27
	s.d.	1.94	1.92	1.97
4	Mean	13.71	12.93	13.31
	N	14	15	29
	s.d.	2.84	2.63	2.71
5	Mean	14.20	13.29	13.76
	N	15	14	29
	s.d.	2.91	4.05	3.47
6	Mean	17.13	15.67	16.40[3,4,5]
	N	15	15	30
	s.d.	2.13	2.44	2.37
7	Mean	17.43	15.29	16.24[3,4,5]
	N	14	14	28
	s.d.	2.34	3.07	2.91
Total	Mean	15.25	13.88	14.56
	N	71	72	143
	s.d.	2.93	3.14	3.11

[a] Superscripts indicate the age groups from which that particular mean differs significantly

DeLucia: Boys' mean = 15.25, Girls' mean = 13.88). A significant Age effect was also obtained (Pillais value = .35358, approximate $F = 7.14055$, $p < 1.40E-008$), with univariate tests indicating the existence of significant age-related patterns on both the SERLI, $F(4,133) = 10.54$, $p < 1.896E-007$, and the DeLucia, $F(4,133) = 11.41$, $p < 5.454E-008$. As can be seen in Tables 14 and 15, mean scores on these two measures increased across age groups. Tukey tests conducted on the SERLI scores revealed that activity preferences of the five-year-olds were significantly more sex-typed than those of the three-year-olds and that of the six and seven-year-olds were significantly more sex-typed than both the three and four-year-olds. Similarly, post hoc analysis of the age effect on the DeLucia revealed that the six and seven-year-olds were significantly more sex-typed in their toy choices than were the three, four, and five-year-olds. The multivariate interaction between Age and Sex was not significant indicating that the observed developmental patterns did not differ for boys and girls.

A Sex by Age by Population multivariate analysis of variance conducted on children between the ages of three and six did not indicate any differences in developmental patterns across the elementary and preschool samples. However, a significant Sex X

Population effect (Pillais = .1232, approximate F = 6.89, $p < .002$) did indicate that the previously mentioned sex difference was not stable across the samples. Univariate tests revealed that this interaction was significant only for the SERLI scores, $F(1,99) = 9.85$, $p < .002$, which were higher for boys in the elementary school sample (Boys' mean = 67.00, Girls' mean = 53.36) but did not differ across sex in the preschool sample (Boys' mean = 57.85, Girls' mean = 53.76).

The peer choice and parent questionnaire measures, which are less traditional approaches to assessing sex-typed preference, did not conform, in certain respects, to the findings that have repeatedly been demonstrated in the sex-role development literature. A Sex X Age analysis of variance conducted on scores obtained from the peer choice measure revealed, as expected, a significant effect of Age, $F(4,121) = 5.37$, $p < .001$, which, as can be seen in Table 16, was due to a developmental increase in scores on this measure. A Tukey test revealed that the seven-year-olds were more sex typed in their peer choices than were the three, four, and five-year-olds. However, contrary to expectation, a significant effect of Sex, $F(1,121) = 11.47$, $p < .001$, revealed that girls were more stereotyped in their peer choices than were boys.

Table 16

Means on Peer Choice Measure Across Age and Sex[a]

Age		Boys	Girls	Total
3	Mean	-1.67	4.55	2.35
	N	6	11	17
	s.d.	6.86	7.03	7.42
4	Mean	-1.13	8.00	3.11
	N	15	13	28
	s.d.	8.12	8.29	9.29
5	Mean	2.00	5.29	3.64
	N	14	14	28
	s.d.	9.89	7.43	8.74
6	Mean	5.20	8.80	7.00
	N	15	15	30
	s.d.	6.49	6.22	6.51
7	Mean	10.07	11.14	10.61 3,4,5
	N	14	14	28
	s.d.	5.61	8.13	6.90
Total	Mean	3.44	7.70	5.62
	N	64	67	131
	s.d.	8.54	7.61	8.34

[a] Superscripts indicate the age groups from which that particular mean differs significantly.

As it was not possible to administer the peer choice measure to all of the three-year-olds because of the fact that many children in this age group who were tested at home did not attend a preschool, the Sex X Age X Population analysis of variance conducted on this measure required the elimination of not only the seven-year-olds but the three-year-olds as well. This analysis revealed a marginal interaction between Sex and Population, $F(1,74) = 3.18$, $p < .09$, suggesting a tendency for the obtained sex difference to occur only in the preschool sample. It is possible that the relatively low frequency of same-sex peer choices made by boys as compared to girls is a result of differential teacher reactions to boys and girls in the classroom. It has been demonstrated that teachers are more likely to reprimand problem behaviors when they are displayed by boys than when they are displayed by girls (Serbin, et. al., 1973) and that sex typing in boys is more likely to be associated with teachers' perception of problem behaviors (Sprafkin, Serbin, and Elman, 1982). It may be that boys' awareness of the relatively negative teacher reactions towards their same-sex peers caused them to refrain from making male choices on this measure in the presence of the adult female examiners, whom they may have perceived as having similar attitudes to those of their

classroom teacher. The finding that this effect was apparent in the preschool but not in the elementary school may have been due to attitudinal and behavioral differences between the adults in these two settings in relation to sex-role stereotypes. Observation and conversation with both teachers and principals at the two schools strongly suggested that the attitudes of individuals within the elementary school as well as the general school philosophy were far less traditional in terms of sex-role stereotypes than in the preschool.

Scores reflecting children's degree of sex-typed play at home derived from mothers' reports of frequency of play with various specific toys (see Table 17) did not increase across age groups, $F(4,92) = .96$, n.s. The predicted sex difference was obtained, however, $F(1,92) = 9.78$, $p < .002$, with mothers of boys reporting play patterns that were more sex typed (Mean score for boys = 1.02) than those observed by mothers of girls (Mean score for girls = .52). However, an Age X Sex X Population analysis conducted on children between the ages of three and six revealed a significant interaction between Sex and Population, $F(1,49) = 6.78$, $p < .01$, indicating that boys' scores were more sex typed than those of girls only within the elementary school sample. Thus, three out of the four measures of sex-typed preference did

Table 17

Means on Measure Assessing Sex Typing of Play in the Home by Age and Sex

Age		Boys	Girls	Total
3	Mean	1.21	.39	.75
	N	7	9	16
	s.d.	1.25	.93	1.13
4	Mean	1.09	.66	.83
	N	9	14	23
	s.d.	.78	.76	.78
5	Mean	.68	.18	.47
	N	11	8	19
	s.d.	1.00	.52	.85
6	Mean	1.18	.51	.90
	N	11	8	19
	s.d.	.67	.90	.82
7	Mean	1.01	.74	.90
	N	15	10	25
	s.d.	.71	.58	.66
Total	Mean	1.02	.52	.78
	N	53	49	102
	s.d.	.85	.75	.84

not display the expected sex differences within the preschool sample: two of the measures showed no significant difference between the scores of boys and girls, and one displayed a difference in the opposite direction, with girls' scores indicating a greater degree of sex typing than those of boys.

As predicted, in contrast to the measure of gender-based classification, which indicates a decrease in the degree to which the child focuses on gender at a cognitive level, children's sex-typed toy and activity preferences, at least as displayed by the more traditional laboratory measures, displayed gradual increases with age. These age-related patterns did not appear to be affected by developmental shifts in children's gender-based classification. Rather, the maintenance of sex-typed preferences with age is similar to the pattern observed on the measure of gender-based affiliation. These measures are also similar in that they both yielded differential results as a function of sex. The measure of gender-based affiliation revealed that boys' scores increased with age whereas those of girls did not. Likewise, aside from certain unexpected patterns within the preschool sample, boys' sex-typed preferences were generally more stereotyped than those of girls, a sex difference that has been repeatedly found in the literature. This is in contrast to

gender-based classification and more traditional cognitive measures of sex-role development on which mean scores and developmental patterns were consistent across sex. As predicted then, the measure of gender-based affiliation was more similar to traditional measures of sex-typed preference than were the items assessing degree of gender-based classification.

Zero-order correlations as well as partial correlations controlling for age were conducted in order to examine the hypothesis that children's scores on the measure of gender-based affiliation would be more likely to predict individual differences in sex-typed preference than would degree of gender-based classification. These analyses were conducted separately for boys and girls as the Sex X Age interaction obtained in analyses examining developmental patterns in gender-based affiliation suggested that relationships with this measure might vary across gender. As can be seen in Table 18, this hypothesis was supported. For the boys, two out of the four measures of sex-typed preference, the SERLI and the DeLucia, displayed correlations with gender-based affiliation which remained significant when the effects of age were controlled. For the girls, the peer choice measure was significantly related to gender-based affiliation scores after the effects of age were

Table 18

Correlations Between Measures of Sex-Typed Preference and Scores on Gender-Based Affiliation and Classification

	Gender-Based Affiliation		Gender-Based Classification	
	Zero-Order Correlations	Age Controlled	Zero-Order Correlations	Age Controlled
SERLI Sex-Role Preference				
Boys (N=69)	.46***	.28*	-.03	.08
Girls (N=70)	.20	.21	-.15	.11
DeLucia Toy Choice				
Boys (N=69)	.54***	.35**	-.05	.07
Girls (N=70)	.22	.23	-.15	.06
Peer Choice				
Boys (N=62)	.38**	.16	-.03	.06
Girls (N=65)	.42***	.43***	-.05	.09
Parent Report of Play at Home				
Boys (N=51)	.01	.03	-.16	-.18
Girls (N=47)	.05	.06	-.01	.03

$^{*}p < .05$

$^{**}p < .01$

$^{***}p < .001$

controlled. In contrast, there were no significant correlations between gender-based classification and the sex-typed preference measures, even when the effects of age were controlled so as to prevent an underestimate of the magnitude of the relationship because of opposing developmental patterns.

It is true that relationships between gender-based affiliation and sex typing measures are not consistent across sex and do not always remain significant when the effects of age are controlled. However, an examination of Table 19, which depicts partial correlations between all pairs of sex typing measures that were related to age and for which a significant overall correlation had been obtained (see Table 13), reveals that this lack of consistency is typical of sex typing measures in general. As can be seen in Table 19, the relationship between the DeLucia and SERLI preference measures remains significant for both boys and girls when the effects of age are controlled. However, the peer choice measure is no longer significantly related to scores on the SERLI for either boys or girls when variability due to age is partialled out. In addition, the relationship between the peer choice and the Delucia remains significant only for the girls when variability due to age is controlled. Thus, zero-order correlations among some sex typing measures appear to

Table 19

Relationships Among Measures of Sex-Typed Preference with Effects of Age Controlled

		Zero-Order Correlation	With Age Controlled
DeLucia Toy Choice and SERLI-Sex-role Preference	Boys (N=69)	.48***	.30**
	Girls (N=70)	.57***	.46***
Peer Choice and SERLI Sex-Role Preference	Boys (N=61)	.39***	.22
	Girls (N=65)	.33**	.24
Peer Choice and DeLucia Toy Choice	Boys (N=61)	.26*	.00
	Girls (N=65)	.49***	.42***

*p < .05

**p < .01

***p < .001

be due largely to similar developmental patterns as opposed to indicating the prediction of individual differences in children's sex-typed preferences within age groups. In addition, the degree to which sex typing scores on one measure are predictive of individual differences on another varies across gender.

Relative Degree to Which Environmental and Cognitive Factors Predict Gender-Based Classification and Affiliation

It was hypothesized that the tendency to categorize new information on the basis of gender is a process determined largely by the child's level of cognitive development and would be relatively impervious to environmental influences. However, it was expected that the degree to which the child relies upon the gender dimension to make personal choices might be determined, in part, by the extent to which such choices are modeled and reinforced within the environment. In order to evaluate these predictions, the child's level of cognitive development, as measured by his/her mental age on the Peabody Picture Vocabulary Test as well as the three scores reflecting degree of sex typing in the home (i.e. mother's reaction to toys, mother's behaviors and activities as measured by the SRBS-2, and maternal employment) were correlated with gender-based

classification and affiliation.

As predicted, the correlations displayed in Table 20 reveal that mental age is significantly related to gender-based classification, with greater cognitive maturity being associated with decreasing use of gender as a dimension along which to classify new information, but not to gender-based affiliation. However, the hypothesis that indices of parental sex typing would be more strongly predictive of gender-based affiliation received only weak support. As can be seen in Table 20, only one parent measure, that assessing degree of sex typing in mother's attitude towards her child's play, showed a small and marginally significant positive relationship with children's gender-based affiliation scores. No other relationships between parental sex typing and gender-based affiliation were obtained and, as expected, there were no significant correlations between the environmental measures and gender-based classification.

Gender-Based Classification as a Mediator of the Relationship Between Sex Typing of Parent and Child

Although it had been predicted that children's tendency to categorize new information along the gender dimension would not be significantly related to degree of parental sex typing, it was

Table 20

Correlations to Determine Relative Degree to which Sex Typing in the Environment and Level of Cognitive Development are Predictive of Gender-Based Classification and Affiliation[a]

	Gender-Based Classification	Gender-Based Affiliation
Mental Age	-.47***	.10
Sex-Typing of Mother's Reaction to Toys	-.01	.20*
Sex-Role Behavior Scale	.02	-.13
Maternal Employment	.04	-.04

[a] Number of cases in all correlations is 92.

*p<.06

***p<.001

hypothesized that this cognitive process might play an important role in determining the extent to which the child's behavior is influenced by the relative degree of behavioral and attitudinal sex-role stereotyping present in his/her environment. That is, it was predicted that gender-based classification would mediate the relationship between indices of parental sex typing and measures of children's sex-typed preference.

In order to first examine the zero-order relationships between parent and child measures, correlations were conducted between the three indices of parental sex typing and two variables representing the child's degree of sex typing: one reflecting extent of sex-typed play in the home as reported by parents, and the other comprised of the sum of the child's standard scores on the SERLI sex-role preference measure, the DeLucia toy choice procedure, and the peer choice measure. These latter measures were combined into a single score as the previously reported correlations revealed that they were significantly related to each other. The parental questionnaire assessing children's sex-typed play at home was examined separately as it was felt that any obtained correlations between this and measures of parental sex typing needed to be interpreted with caution because of the possibility that mothers were simply

viewing their children in a manner coincident with their own sex-typed attitudes and behaviors. Out of the 93 children whose mothers mailed in complete and usable questionnaires, only 83 responded to all of the laboratory sex typing measures. Thus, the number of cases included in this and all subsequent analyses is 83.

As can be seen in Table 21, the only significant correlation obtained revealed a positive relationship between mothers' sex-typed attitudes towards toys and children's responses on laboratory measures of sex-typed preference. However, the reduction in the magnitude of this correlation when calculated within each sex reveals that this relationship is largely due to the fact that boys scored higher than girls on two out of the three laboratory sex typing measures and also had mothers with significantly more sex-typed attitudes regarding play than did girls, $t(99) = 5.91$, $p < .0001$ (Mean for boys = 1.24, Mean for girls = .18). Thus, mother's sex-typed attitudes towards play were not found to predict individual differences in children's sex typing within each sex.

Multiple regression analyses were conducted in order to determine whether there is support for the hypothesis that the relative extent to which children rigidly process information

Table 21

Correlations Between Degree of Sex Typing of Parent and Child

Parental Variables		Child Variables	
		Sex Typing on Laboratory Measures[a]	Sex Typing of Play at Home
Sex Typing of Mother's Reaction to Toys	All Subjects[b]	.26*	.11
	Males	.18	-.04
	Females	.11	.00
Sex-Role Behavior Scale	All Subjects	-.19	-.07
	Males	-.23	-.17
	Females	-.06	.15
Maternal Employment	All Subjects	.10	-.06
	Males	.10	.08
	Females	.08	-.23

[a] This variable is comprised of the sum of the child's standard scores on the SERLI Sex-Role Preference, DeLucia Toy Choice, and Peer Choice Measures.

[b] Correlations for all aubjects contain 83 cases; correlations for males only contain 42 cases; correlations for females only contain 41 cases.

* $p<.05$

along the gender dimension plays a significant role in determining the degree to which the child's behavior is affected by the models present in his/her home environment. Twelve multiple regressions were conducted, six for boys and six for girls. The criterion variable for each analysis was one of the two child sex typing measures and the predictor variables included one of the three parental instruments, child's age, and child's gender-based classification score. Age was included as a predictor variable because of the fact that previous researchers had found this factor to be an important mediator of the relationship between parental sex typing and child sex typing, with scores of older children being correlated with those of their parents and scores of younger children being unrelated. The aim here was to determine whether such findings are due to the greater cognitive rigidity of younger children as compared to older children; that is, their tendency to view their world along a rigid male-female dimension, causing them to focus on information that conforms to traditional sex-role stereotypes and to disregard that which contradicts such stereotypes. As age is strongly related to degree of gender-based classification, with younger children displaying a greater tendency to sort new information along this dimension, it was necessary to control for

the effects of this variable prior to examining the contribution of gender-based classification in mediating the relationship between parent and child sex typing.

In each analysis, the first-order variables, child's age, parental sex typing, and gender-based classification, were entered first, in a stepwise fashion. Following this, vectors representing the interactions of Parent Sex Typing X Age of Child, Parent Sex Typing X Gender-based Classification, and Age of Child X Gender-based Classification were entered hierarchically in the stated order. Finally, the three-way interaction of Parent Sex Typing X Age of Child X Gender-based Classification was entered. Results of these analyses are presented in Appendix XVI.

Mother's Reaction to Toys. Analyses in which the sex typing of mother's reaction to toys was employed as the parent variable revealed that age was the only significant predictor of boys' sex typing scores on laboratory measures. However, for girls, the vector representing the interaction between gender-based classification and mother's sex typing was also a significant predictor, revealing that the correlation between girls' sex typing on laboratory measures and mothers' attitudes towards play differs depending upon the degree to which the child categorizes

information on the basis of gender. Separate correlations were conducted between parent and child sex typing variables for those girls falling above and below the median on gender-based classification. These correlations revealed a marginally significant positive relationship between parent and child sex typing for girls low in gender-based classification, $r(22) = .35$, $p < .10$, but no relationship for girls high in gender-based classification, $r(21) = -.04$, ns. Thus, for the girls, gender-based classification functioned as a moderator variable, in the predicted manner, in the relationship between mother's attitudes towards play and the child's scores on laboratory sex typing measures.

However, this parental variable did not interact with gender-based classification in the prediction of children's degree of sex-typed play at home. The only significant predictor of children's sex-typed play at home, for both the boys and the girls, was the vector representing the interaction of Child's Age X Gender-based Classification, indicating that the relationship between gender-based classification and this sex-typing variable differs depending upon the age of the child. For the males, correlations conducted in order to interpret this finding revealed a negative relationship between sex typing of play at

home and degree of gender-based categorization for the younger boys ($r(23) = -.45$, $p < .03$), but no relationship between these two measures for the older boys ($r(30) = .03$, n.s.). Thus, unexpectedly, for younger boys, the tendency to categorize new information along the gender dimension was associated with mothers' reports of a low frequency of sex-typed play at home. Correlations conducted in order to interpret this significant interaction for the girls revealed a very different pattern. That is, as might be expected, a positive relationship between sex typing of play at home and degree of gender-based categorization was obtained for the younger girls ($r(28) = .45$, $p < .02$). However, although a significant relationship was not obtained for the older girls, there was a marginal tendency for high levels of gender-based categorization to be associated with low levels of sex-typed play in the home for these girls ($r(21) = -.38$, $p < .09$). Given that high levels of gender-based categorization are considered to reflect cognitive rigidity regarding gender categories, the tendency for this pattern to be associated with low levels of sex typing at home for young boys and older girls is puzzling. As such a pattern was observed only when employing the sex typing measure based upon mothers' reports, it is possible that these unexpected results reflect

parental desires and expectations concerning their children's behavior as opposed to an actual tendency for children high in gender-based catgorization to be relatively uninterested in playing with sex-typed toys at home. For example, it is possible that mothers become particularly concerned when their preschool boys show a tendency to view the world along a rigid male-female dichotomy and thus, attempt to modify their attitudes and play behaviors in a less stereotyped direction. These mothers' desire to see their sons as less stereotyped may have distorted their estimates of their child's frequency of play in various activities. The absence of such a negative relationship for the preschool girls may be due to the fact that the sex-typed behaviors of girls are often considered to be less troublesome and more socially acceptable than those of boys. Thus, mothers may have less of a tendency to attempt to modify rigid sex-role attitudes and behaviors in their young girls. The trend towards a negative relationship between gender-based catgorization and sex typing of play at home among the older girls may be due to mothers' emerging concern that their daughters' tendency to categorize the world along a rigid gender dichotomy will interfere with their ability to achieve academic and occupational success. In contrast, the lack of a negative relationship for

the older boys may be due to the fact that male sex-typed behaviors, which are often regarded unfavorably at younger ages, are beginning to be valued because of their association with power and achievement.

Mother's SRBS-2 Scores. Analyses in which the sex typing of mothers' behaviors and activities, as measured by the SRBS-2, was employed as the parental variable revealed that age was the only significant predictor of sex typing scores on laboratory measures for both boys and girls. Once again, the only significant predictor of children's sex-typed play at home was the vector representing the interaction of Child's Age X Gender-based Classification. This finding was obtained only for the girls. Thus, these analyses did not provide support for the hypothesis that gender-based classification functions as a moderator variable in the relationship between mother's sex-typed behaviors and activities and the child's scores on measures of sex-typed preference.

Mother's Employment History. Analyses using mother's employment history as the parental variable revealed that only age was a significant predictor of sex typing scores on laboratory measures for the girls. For the boys, the vector representing the interaction between gender-based classification

and mother's sex typing was also a significant predictor of laboratory sex typing scores. However, an examination of the correlations between these parent and child sex typing variables for those boys falling above and below the median on gender-based classification revealed that this effect was not in the predicted direction. For boys low in gender-based classification, there was no significant relationship between parent and child measures, $r(24) = -.13$, ns., whereas there was a marginally significant relationship for boys high in gender-based classification, $r(16) = .44$, $p < .08$. Thus, contrary to expectation, this analysis revealed that it was those boys with the greatest tendency to categorize new information along the gender dimension who were most strongly affected by their mother's employment history. However, the direction of this relationship was opposite to that which had been expected, revealing that mothers' employment was associated with greater sex-typed preferences in their sons.

When degree of sex-typed play at home was used as the criterion variable, only the vector representing the interaction of Age X Gender-based Classification was found to be a significant predictor for the girls. However, for the boys, the vector representing the interaction of Child's Age X Gender-based

Classification X Maternal Employment was found to be significant. An examination of the correlations relevant to this finding revealed that mother's employment and child's degree of sex-typed play in the home were unrelated for the younger boys (i.e. boys less than 65 months), regardless of whether they were above ($r(6) = .30$, ns.) or below ($r(10) = -.27$, ns.) the median in terms of their tendency to categorize new information on the basis of gender. Interestingly, however, for the older boys, significant correlations were obtained between these variables, and the direction of the relationship differed as a function of the degree to which the child categorized new information on the basis of gender. For older boys obtaining low scores on gender-based classification, the predicted negative correlation was obtained ($r(18) = -.57$, $p < .01$), with maternal employment related to lower sex-typed play scores. However, for older boys obtaining high scores on gender-based classification, a positive relationship was once again obtained ($r(10) = .63$, $p < .04$), revealing that maternal employment is associated with a greater degree of sex-typed play for these children.

Gender-Based Affiliation as a Mediator of the Relationship Between Sex Typing of Parent and Child

It had been hypothesized that children's tendency to

categorize new information along the gender dimension would most strongly influence the degree to which their behavior reflects the level of sex typing in the home environment. However, it was suggested that the measure of gender-based affiliation might mediate this relationship as well, in that the child's tendency to affiliate with individuals of a particular gender might facilitate his/her tendency to learn and incorporate the behaviors of that sex. Given that a large majority of the children obtaining high scores on the measure of gender-based affiliation demonstrated a preference for their own gender, this hypothesis suggests that girls who are high in gender-based affiliation would display sex typing scores that are more related to those of their mothers than would girls low in gender-based affiliation. As data on the sex typing of fathers was not available, a direct assessment of this hypothesis among the boys is not possible. However, it might be expected that the presumed tendency of boys who are high in gender-based affiliation to actively seek out the companionship of their fathers more frequently than that of their mothers would result in somewhat less exposure to and less opportunity to incorporate the behaviors, attitudes and preferences of their mothers as compared to boys who tend to make affiliation choices on the basis of cues

other than gender.

In order to determine whether the measure of gender-based affiliation mediates the relationship between indices of parental sex typing and measures of children's sex-typed preference, twelve additional multiple regression analyses were conducted. These analyses were identical to those previously described except that gender-based affiliation scores were employed in place of scores on the gender-based classification measure. Results of these analyses are presented in Appendix XVII.

Mother's Reaction to Toys. Analyses in which sex typing of mother's reaction to toys was employed as the parent variable revealed that Age and Gender-based affiliation were the only significant predictors of boys' sex typing scores on laboratory measures and that Age was the only significant predictor for the girls.

Analyses employing children's sex-typed play in the home as the criterion variable revealed no significant predictors for the boys. For the girls, the only significant predictor was the vector representing the interaction of Child's Age X Gender-based affiliation, indicating that the relationship between children's tendency to make affiliation choices based upon gender and their degree of sex-typed play at home varies as a function of age.

Correlations conducted to further examine this finding revealed that gender-based affiliation and sex typing of play at home are positively related for the younger girls ($r(28) = .38$, $p < .05$) but not for the older girls ($r(21) = -.40$, n.s.). This pattern is fairly similar to that observed in analyses employing the measure of gender-based categorization and may be due to the tendency for mothers of older girls to be concerned about highly sex-typed attitudes in their daughters. This concern may cause those mothers whose daughters have the greatest tendency to affiliate by gender to provide a somewhat distorted report of degree of sex typed play at home, underestimating such activities because of their desire to see their children as less stereotyped.

Thus, these analyses did not provide support for the hypothesis that children's tendency to make affiliation choices based upon gender affects the degree to which their sex-typed behaviors and preferences are influenced by mothers' degree of sex-typed attitudes towards play.

Mothers's SRBS-2 Scores. Analyses in which the sex typing of mothers' behaviors and activities, as measured by the SRBS-2, was employed as the parental variable revealed that only Age was a significant predictor of sex typing scores on laboratory

measures for the girls. However, for the boys, the vector representing the interaction between gender-based affiliation and mother's degree of sex typing was also a significant predictor. Correlations conducted in order to further interpret this finding revealed that the sex typing scores of boys who have a tendency to make affiliation choices based upon gender were not related to those of their mothers ($r(25) = .07$, n.s.). However, as predicted, a significant relationship ($r(20) = -.55$, $p < .01$) was obtained for boys who did not tend to make affiliation choices on the basis of gender and who, presumably, were less inclined than their peers to seek out and spend a greater amount of time with their fathers as opposed to their mothers. Thus, among these boys, those whose mothers were highly feminine in their behavior tended to display relatively few masculine preferences on laboratory sex typing measures.

Analyses employing children's sex-typed play at home as the criterion variable revealed no significant predictors for the boys. Once again, the vector representing the interaction of Child's Age X Gender-based affiliation was the only significant predictor for the girls.

Mother's Employment History. Analyses using mother's employment history as the parental variable revealed no predicted

interaction effects. Thus, Age was the only significant predictor of sex typing scores on the laboratory measures for girls and for the boys, only Age and Gender-based affiliation were predictive of laboratory sex typing scores. The only significant predictor of sex typing of play at home was the interaction of Age X Gender-based affiliation for the girls. Thus, these analyses did not provide support for the hypothesis that gender-based affiliation mediates the relationship between mother's degree of involvement in occupational activities and the degree to which children adopt sex-typed preferences and behaviors.

Discussion

The results of the present study indicate that it is possible to obtain reliable measurements of the tendency to employ the gender dimension to categorize others and to make personal choices in children between the ages of three and seven. By the age of three, children do use the gender dimension to some extent to categorize people, in spite of the fact that other cues are available for classification, and also make some of their affiliation choices on the basis of sex as opposed to other relevant dimensions. As predicted, the use of gender to structure information about others and the reliance upon this dimension to make choices for the self appear to be different processes that vary both in terms of age-related patterns and in their relationship with traditional measures of sex-role development.

Gender-Based Categorization: Developmental Patterns and Correlates

As predicted, the process of classifying others on the basis of gender was found to be moderately related to the child's level of cognitive maturity and to be unrelated to the level of stereotyping that exists in the home environment. While gender

was found to be the predominant classification dimension among three-year olds, being employed on 56% of responses at this age, sorting of others on the basis of sex, at least as measured by this instrument, virtually disappears in most children by the age of 7, suggesting that it represents a cognitive process operative during a particular phase of development. As would be expected of a process determined largely by level of cognitive maturity, this age-related pattern was found to be consistent for boys and girls. Differences that were obtained across the two samples appeared to reflect a more rapid movement through this developmental process in the elementary school children than in the preschoolers; a finding that is not surprising given the fact that the former sample was significantly brighter than the latter.

As hypothesized, gender-based categorization was not predictive of individual differences in children's degree of sex-typed preference. Although this finding is inconsistent with the previously mentioned studies on adults conducted by Bem and by Markus and her colleagues which revealed that gender-based schematic processing was most pronounced in sex-typed individuals, it is consistent with the results of some of the investigations employing children. It appears that use of the

gender dimension to classify others may be so universal in young children, and that variability may be so strongly determined by level of cognitive maturity, that individual differences at this stage are overshadowed by developmental aspects of the phenomenon.

As hypothesized, however, it was discovered that age-related patterns in gender-based categorization did coincide with developmental shifts in certain cognitive aspects of sex-role acquisition. The tendency to categorize new information on the basis of gender was highest at the age of three, immediately prior to the period during which children displayed a significant developmental increase in their degree of knowledge concerning traditional sex-role stereotypes. This finding is consistent with the hypothesis that gender-based categorization facilitates the learning and memory of those behaviors and activities typically associated with each sex in our society. However, correlations conducted between these two measures within the youngest age groups revealed that degree of gender-based categorization did not predict level of sex-role knowledge. As stated, it is possible that this is due to the fact that the level of gender-based categorization displayed by the majority of three-year-olds, including those who scored relatively low

compared to their peers, is sufficient to result in attention to and incorporation of basic facts concerning sex-role stereotypes. It may be that investigation of children at an earlier developmental level would reveal a stage at which gender-based responding is not yet evident in many of the children, thus allowing a more valid examination of the hypothesis that some rudimentary tendency to categorize by gender is necessary for the acquisiton of sex-role knowledge. It might be possible to administer the current measure to two-year-olds if the verbal instructions were supplemented with a series of training items in which the examiner demonstrates a matching task employing simple stimuli such as geometric shapes and then encourages the child to participate.

In addition, the decrease in children's degree of gender-based categorization that occurred at age six coincided with a significant increase in the flexibility of their attitudes concerning sex-role stereotypes. This is consistent with the idea that a decreased reliance upon the rigid cognitive categories of male and female may enable children to notice and incorporate examples of nontraditional behaviors available in their environments. Although the correlation between these two measures was only marginally significant once age was controlled,

possibly due to limited variability within the older age groups on the measure of gender-based classification, Guttman analyses revealed that individual children do, indeed, tend to display a decrease in gender-based categorization prior to exhibiting high levels of flexibility in their attitudes towards the roles of men and women.

A significant Guttman analysis, indicating that, for individual children, attainment of a high level of sex-role knowledge generally precedes a decreased reliance upon gender for categorization, supports the hypothesis that the developmental decrease in degree of gender-based categorization may reflect the child's desire to employ new and more challenging dimensions once certain basic aspects of sex-role knowledge are mastered. Empirical support was not obtained for the idea that the decrease in gender-based categorization at age six is due to the reduced importance of gender-related activities and behaviors once the child attains the concept of gender constancy and realizes that his/her sex is not determined by such superficial characteristics. Children's scores on the Slaby and Frey gender constancy questionnaire did not indicate a significant increase in degree of gender understanding at age six. In addition, a Guttman analysis revealed that many children displayed low levels

of gender-based categorization prior to the attainment of gender constancy.

It is possible that methodological difficulties associated with the measurement of gender constancy obscured the role that this concept might play in the developmental decrease in gender-based categorization. Previously, it had been suggested that the Slaby and Frey procedure may result in overestimates of gender understanding due to the tendency of young children to respond correctly on the basis of their knowledge of social convention rather than on the basis of a realization of the unchangeability of gender. Additionally, this measure's reliance upon fairly complicated verbal items might cause certain children who have an understanding of the permanence of gender to provide nonconstancy responses due to difficulty understanding the question. Wehren and DeLisi (1983), who recently employed a new method of assessing gender constancy in which children are required to provide explanations for each of their judgments, reported that although a high percentage of correct judgments were provided by children as young as three, explanations based upon a true understanding of the unchangeability of gender did not begin to occur with any frequency until the age of seven. Thus, although no marked increase in constancy judgments was

observed in the present investigation, it is possible that a more extensive questioning of the reason behind such judgments would have revealed that an increase in gender understanding does, indeed, occur at the older ages. Future research will be required to more systematically assess the possible role played by gender constancy attainment in the developmental decrease in children's use of gender to categorize others.

The fact that most of the seven-year-olds employed in this investigation made no gender choices at all on this measure does not indicate that the cognitive categories of male and female do not exist beyond this age and are not operative in the structuring of information. The measure employed in this investigation provided a rather obvious choice between gender and nongender cues and, as such, could be considered to constitute an assessment of children's tendency to consciously classify new information on the basis of the gender dimension when other relevant cues are available. It is this uninhibited and conscious reliance upon gender in three-year-olds that may account for their rapid learning of sex-role information and their attitudinal rigidity and it is the virtual disappearance of such conscious gender-based processing at the age of six that may enable greater cognitive flexibility regarding sex roles.

However, although seven-year-olds may no longer consciously choose gender as a dimension along which to structure information, the previously discussed investigations employing more subtle tasks involving memory and reaction time have revealed that gender-based processing continues to occur in older children and adults and that it has a predictable affect upon the way in which information is encoded and retrieved. Thus, by the age of seven, children's use of the gender dimension for processing information about others appears to be almost entirely a subtle and automatic process of which they are unaware. Investigations of this more subtle process in order to determine its developmental course and correlates are important as it may play a crucial role in the maintenance of certain sex-role attitudes and behaviors beyond the period of early childhood.

Given that gender-based categorization appears to be largely a cognitively determined process, it becomes important to address the issue of whether it is simply a measure of intelligence. Although scores on this measure are marginally related to IQ ($r(145) = -.15$, $p < .08$), they are more strongly related to mental age ($r(147) = -.47$, $p < .001$), suggesting that it is the child's stage of cognitive development as opposed to his/her degree of intelligence that is most important in determining this

process. In addition, although gender-based categorization was negatively correlated with IQ, this relationship was found to be inconsistent across age, achieving significance only among the four-year-olds. It is possible that this relationship between IQ and gender-based responding is due to the tendency for brighter children to attain the stage of decreased reliance upon gender prior to their peers, who will display such a decline at around the age of six. Thus, the obtained relationship between IQ and gender-based categorization, rather than indicating a stable overall relationship between these two variables, appears to reflect the tendency for brighter children to achieve certain cognitively determined developmental milestones before their peers.

Gender-Based Categorization and Parental Sex Typing

Only limited support was obtained for the hypothesis that the degree to which a child categorizes information on the basis of gender affects the extent to which he/she is influenced by the actual amount of sex-role stereotyping present in the home environment. Degree of gender-based categorization did, indeed, moderate the relationship between mothers' attitudes regarding sex-typed play and girls' scores on laboratory measures assessing

sex-role preferences. Parent and child sex typing were positively correlated for those girls who tended to categorize information on the basis of nongender cues but were unrelated for girls who relied heavily upon gender-based processing. This finding is consistent with the idea that gender-based categorization is a rigid cognitive process that causes children to be relatively impervious to the full range of counterstereotyped and traditional information provided by the environment. This finding could help to explain why so many of the studies examining the relationship between parent and child measures of sex typing in preschoolers have yielded negative results. In addition, these data should encourage parents and educators to continue providing nonstereotyped messages and models for children in spite of their relative imperviousness at young ages, as they appear to become more receptive once the tendency to incorporate information along a rigid gender dimension declines.

Gender-based categorization was also found to moderate the relationship between maternal employment history and boys' degree of sex typing on both laboratory measures and in the home. However, the nature of this effect did not conform to the expectation that children high in gender-based categorization

would be unaffected by mother's involvement in employment activities whereas children low in gender-based categorization would be receptive to the information that such occupational involvement provides concerning mother's degree of conformity to traditional sex roles. Unexpectedly, maternal employment was not related to the laboratory sex typing scores of boys low in gender-based categorization, but was positively related to the scores of boys high in gender-based categorization. Maternal employment was also positively related to degree of sex-typed play in the home for older boys who tended to process information along the gender dimension, whereas it was negatively related to degree of sex-typed play in the home for older boys that were low in gender-based categorization.

Thus, although, as expected, greater maternal employment was associated with lower levels of sex typing in the home for boys who did not tend to classify others on the basis of gender, this effect was further moderated by age, occurring only for older children. Thus, there is some evidence that the meaning and impact of a child's level of gender-based processing may be affected by the stage of development at which it occurs. In addition, although, as expected, boys high in gender-based categorization did not appear to respond to the nontraditional,

egalitarian model provided by high levels of maternal employment, the fact that the opposite relationship was obtained, with greater occupational activities on the part of mothers being associated with increased sex typing in these boys was, at first, puzzling. This finding must be interpreted with caution as it is possible that the obtained positive relationship is due in large part to a population difference as mothers within the elementary school sample obtained higher employment scores than mothers of preschool children and boys within the elementary school obtained higher scores on three out of the four measures of sex typing than did boys in the preschool. To the extent that this finding is more than simply a statistical artifact, it could be related to the decreased amount of time spent with mother that inevitably coincides with her increased employment and the resulting increases in children's unsupervised exposure to the sex-typed models presented on television and in the amount of time spent with adolescent babysitters who may have fairly rigid attitudes regarding traditional sex-role standards (Ullian, 1976). Boys high in gender-based categorization, being particularly prepared to incorporate information in a stereotypic manner, may be dramatically affected by this increased exposure to such sex-typed models. This analysis of the obtained positive

correlation for boys high in gender-based categorization is, of course, purely speculative. Regardless of the underlying mechanism, however, the fact that a different relationship was obtained for boys low and high in gender-based categorization suggests that the child's way of processing gender-related information may affect the impact of maternal employment. As the effect of maternal employment upon children's development is an area of great social concern, it would seem important to determine whether this finding can be replicated and to investigate the mechanisms that might account for it.

In general, however, evidence that degree of gender-based processing moderates the relationship between parental and child sex typing was rather weak. Those effects that were obtained were inconsistent across sex, and gender-based categorization was not found to play a moderating role for either boys or girls in predicting children's sex typing on the basis of mothers' scores on the Sex-Role Behavior Scale. Two methodological factors may have contributed to these rather weak and inconsistent results. First, it is possible that certain of the parental measures employed assessed behaviors that were simply not relevant to the specific toy, activity, and peer preferences assessed in the children. That is, as the activities contained within the SRBS-2

are only relevant to adults and do not communicate information specific to the play behaviors of young children, it is perhaps not surprising that such aspects of parental behaviors are unrelated to degree of sex typing in children's play, regardless of how receptive the child is, at a cognitive level, to incorporating environmental information. It is noteworthy in this regard, that the most specific parental measure, that assessing mothers' reactions to their children's sex-typed play, was the only one that yielded clear results in support of the moderating role of gender-based categorization. It is possible that future investigations, employing measures that assess similar attitudes and behaviors in parents and their children, would enable a more appropriate test of the moderating role played by the cognitive tendency to categorize others on the basis of gender.

Second, it is possible that some of the inconsistencies across gender that were obtained in this study would have been more understandable if a sufficient number of fathers had responded to enable the inclusion of their data. For example, the finding that gender-based categorization moderates the relationship between the child's sex typing and maternal attitudes towards play for the girls but not for the boys might

be due to the tendency for a boy to observe and incorporate the behaviors of his father to a greater degree than those of his mother. Thus, it may be that the same effect occurs for boys when data from fathers is examined. A more concerted effort in future research to solicit responses from fathers as well as mothers may enable a clarification of some of the inconsistencies obtained across sex in this study.

Gender-Based Affiliation Preferences

As expected, in contrast to the use of gender in categorizing others, reliance upon this dimension for making affiliation choices was not related to the child's mental age. However, the hypothesis that degree of gender-based affiliation would be related to the amount of stereotyping present in the home environment was only weakly supported. It is possible, though, that this was partially due to the previously mentioned difficulty concerning the generality of the parental measures employed. The finding that boys and girls display differential age-related patterns in gender-based affiliation, in the absence of any IQ differences across gender, with responses of boys increasing developmentally and those of girls remaining relatively stable, is suggestive of a process that is influenced,

at least in part, by the greater environmental pressures towards sex typing that are experienced by males in our society. Thus, the obtained marginal relationship with parental measures of sex typing combined with the differential pattern of responding across gender do suggest that the degree to which the child relies upon gender when making affiliation choices may be partially determined by environmental factors.

In addition, in contrast to gender-based categorization, which decreased with age and was virtually absent in the seven-year-olds, personal choices based upon the gender dimension continued to be made frequently by children throughout the age range studied. Gender-based affiliation choices also showed some tendency to predict individual differences in children's scores on traditional measures of sex-typed preference whereas scores on the gender-based classification measure did not.

As predicted, in contrast to the measure of gender-based classification, very little evidence was obtained to suggest that gender-based affiliation functions as a mediator in the relationship between parental and child measures of sex typing. It was found that those boys who did not tend to make affiliation choices based upon gender displayed sex typing scores that were related to the SRBS-2 scores of their mothers whereas the sex

typing scores of boys high in gender-based affiliation were unrelated to maternal sex typing, presumably because of the tendency of these latter boys to spend a greater amount of time with and thus, be most influenced by, the behavior of their fathers as opposed to their mothers. Since data from fathers was unavailable, however, it was impossible to test more directly this hypothesis. However, a direct test of the hypothesis that children high in gender-based affiliation would display a greater relationship between their own sex typing scores and those of their same-sex parent could be conducted among the girls. There was no evidence that the relationship between the sex typing scores of girls and their mothers varied as a function of degree of gender-based affiliation. Thus, support for the role of gender-based affiliation in moderating the relationship between parent and child sex typing was extremely weak and indirect. This is not particularly surprising because, as stated previously, high scores on this measure indicate a tendency to make affiliation choices on the basis of gender and certainly do not reflect exclusive exposure to one particular sex. Thus, a child's preference to affiliate on the basis of gender, in and of itself, does not necessarily have a marked impact upon the degree to which the child has an opportunity to observe, learn and

incorporate the behaviors of the preferred sex as compared to the non-preferred sex. In contrast, the measure of gender-based classification appears to play a more significant role in determining the degree to which the child incorporates the behaviors and attitudes of his/her parents, possibly because it assesses a generalized way of interpreting new information as opposed to the child's relative exposure to same and opposite-sex models.

In summary then, gender-based processing does appear to occur in early childhood and may play an important role in the acquisition and developmental course of sex-typed knowledge, attitudes and preferences. The age-related characteristics of young children's thought processes appear to result in the fairly universal development of cognitive schemas representing the categories of male and female. In addition, the conscious and prevalent use of these categories in structuring information about others and the subsequent developmental decline in such gender-based categorization appear to be determined largely by certain age-related cognitive characteristics. This developmental process may underlie age-related patterns in certain cognitive indices of sex-role development such as the rapid attainment of sex-role knowledge between the ages of three

and four, and the increased flexibility of attitudes that occurs at age seven. In contrast, use of the gender-related information obtained as a result of such categorization to make personal choices remains prevalent throughout the period of early childhood, is less dependent upon cognitive development, displays a greater degree of variability across children, and may be a function of the degree to which gender is stressed as an important aspect of the self concept within the child's environment. The results suggest that this latter process may be the mechanism underlying the development and maintenance of sex-typed preferences.

Although the present study was successful in clarifying the development of gender-based processing and its relationship to traditional measures of sex-role development, any implications discussed concerning the actual role played by such processing in initiating or maintaining various aspects of sex typing must be considered tentative because of the correlational nature of this investigation. The use of longitudinal designs in future investigations, involving repeated assessments of gender-based categorization, affiliation, and traditional indices of sex typing over time, would enable a more definitive examination of the order in which these processes occur and thus, would further

clarify the role played by gender-based schematic processing in sex-role acquisition and development.

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Appendix I

Number of Usable Subjects at Each Level of Age and Sex Obtained from the Six Sources

	Three		Four		Five		Six		Seven		Total
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
Preschool	5	10	9	10	4	5	0	0	0	0	43
Preschool Sibling	0	0	0	0	2	1	2	2	4	1	12
Friend of Preschool Parent	2	0	0	0	1	2	3	2	2	0	12
Total Preschool	7	10	9	10	7	8	5	4	6	1	67

Appendix I continued

	Three		Four		Five		Six		Seven		Total
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
Elementary School	0	0	3	1	7	5	8	11	7	8	50
Elementary School Sibling	2	1	1	2	0	0	0	0	0	0	6
Friend of Elementary School Parent	6	3	2	2	1	1	2	0	2	5	24
Total Elementary	8	4	6	5	8	6	10	11	9	13	80
Total	29		30		29		30		29		

Appendix II

Measure Development

Development of the measures of gender-based processing was conducted over a two-year-period, employing a total of 87 English speaking children obtained from three separate preschool populations. The aim was to develop two types of items, one to assess the child's tendency to employ the gender dimension as opposed to other available dimensions when categorizing new information, and the other to assess the degree to which the child's affiliation preferences are based upon gender as opposed to other available cues.

Sample 1. The first sample consisted of 21 children, ranging in age from three to six, with a mean age of 53 months, attending a day care center serving a lower and middle class population in a large Canadian city. Twelve classification items and five preference items were initially developed and administered to ten of the children in order to examine the distribution of responses to each item.

The format of classification items was similar to that employed in the final version of the measure, which was previoulsy described in this text. Thus, each item required the

child to perform a matching task using colored photographs of adult males and females engaged in various activities. The child was handed a photograph of an individual engaging in an activity and was asked to place this standard on top of the one it "goes with" from a series of three additional photographs. The child had a choice of matching the photograph (e.g. a man who is cooking) to a picture of a same-sex individual engaging in a different activity (e.g. a man who is reading), which would reflect classification on the basis of gender, to a photograph of an opposite-sex individual engaging in the same activity (e.g. a woman cooking), which would reflect categorization on the basis of activity or prop, or to a photograph which was not similar to the standard either in terms of gender or activity (e.g. a woman reading), reflecting a random response or one based on idiosyncratic cues. In contrast to the final version of the measure, initial items were developed such that the prop, body stance, or facial expression depicted in the standard photograph was always identical in all respects to that depicted in the array of photographs from which the child was asked to select a matching picture. Thus, if the standard depicted a man holding a frying pan, the photograph representing categorization on the basis of activity (i.e. the "prop" response) portrayed a woman

holding the same frying pan in an identical manner.

Five initial preference items were developed in which the child was asked a question such as "Who would you like to sing a song with?" and was allowed to choose either an opposite sex person engaging in a relevant activity (e.g. playing the guitar), indicating an affiliation choice made on the basis of nongender cues, a same-sex person engaging in an unrelated activity (e.g. reading), indicating a choice made on the basis of gender, or an opposite sex person engaging in an unrelated activity, indicating a choice made on the basis of idiosyncratic cues.

Two characteristics of the response distribution to each item were examined. First, as the purpose of this measure was to assess childrens' relative use of gender versus nongender cues when classifying information or making affiliation choices, it was important to determine whether or not these relevant cues were being recognized and used. Thus, the number of random responses elicited by each item was examined, and those items for which the random response was selected by at least one third of the subjects were considered to be unusable in the form administered as the relevant cues were apparently either unclear or too subtle to be recognized by this young sample of children. In addition, as the purpose was to develop a measure to assess

the inherent salience of gender at a subjective level, it was important to examine the proportion of gender versus nongender responses to each item to determine whether certain items, because of their objective emphasis of a particular cue, elicited a single type of response from all or almost all of the children in this sample. Thus, it was decided that items eliciting either the gender response or the nongender response from 90% of the children or more would need to be modified as the relative salience of the cues may have been affected more by certain aspects of item construction than by the children's predisposition to focus on certain dimensions.

Examination of the distribution of responses revealed that the greatest difficulty with this initial version of the measure was that several of the classification and preference items elicited nongender or "prop" responses from all of the children. A re-examination of the items made it apparent that certain aspects of item construction had resulted in an inadvertent emphasis upon the nongender dimension. In the classification portion of the measure, items were designed such that it was possible to make an identical match on the basis of nongender cues, as the prop depicted in the initial photograph presented to the child was the same as one of the props in the array of three

pictures from which the child was asked to choose. However, no such identical match could be made on the basis of gender cues, as the individual depicted in the initial photograph was not contained in any of the other pictures for that item. Childrens' comments while being administered these items support the idea that this factor may have played an important role in determining responses. That is, when initially presented with the classification items, several children commented that they could not perform the task as none of the pictures they were allowed to choose from were identical to the standard. All children making such comments eventually responded after being told to pick the picture that was "most like" the standard. However, it is likely that their concern over making an exact match caused them to focus on the nongender cue as it was the only dimension that was depicted in an identical fashion.

In the preference portion of the measure, it became clear that the verbal question (e.g. "Who would you like to sing a song with?") and the relevant prop (e.g. "guitar") were so strongly related that the items, rather than assessing the child's affiliation preference, were measuring, instead, the child's knowledge that the prop depicted in the photograph could be used to engage in the stated activity.

In order to remedy these problems, the classification items were modified slightly so that the prop or body stance depicted in the nongender response was not identical to that shown in the standard. This was accomplished by employing similar but not identical props within an item (e.g. a wrench and a hammer) or by depicting adults, within a particular item, using an identical prop in a different way (e.g. a man leaning against a broom as the standard and a woman using the broom to sweep as the nongender choice). In addition, the preference items were modified such that the question did not relate specifically to the prop depicted in the nongender response. For example, a child might be asked who they would like to invite to their birthday party, with the nongender choice depicting an opposite sex person holding an attractive stuffed animal.

After the twelve classification and five preference items were modified, they were administered to the remaining eleven children in this initial sample in order to examine the distribution of gender, nongender, and random responses for each item. Responses to the classification items revealed that the gender dimension was chosen more frequently than the nongender dimension on all items, with ratios ranging between 1.5 to 1 and 3 to 1. However, all items showed some degree of variability in

contrast to the highly skewed distribution obtained from the original set of items.

The distribution of responses on the preference items was similar to that of the newly developed classification items in terms of gender versus nongender choices. However, random choices, which occurred only rarely in response to the classification items, were much more frequent on the preference items. Given that the gender and nongender cues employed in the preference items were similar to or in some cases identical to those used in the classification items, it was felt that the greater number of random responses probably reflected a real phenomenon whereby children are more influenced by idiosyncratic cues when making affiliation choices as opposed to when they are asked to classify information.

The internal consistency of this second version of the measure was examined (Chronbach's standardized alpha) and revealed coefficients of .90 and .79 for the classification and preference measures, respectively.

Following the work conducted on this sample, it was felt that two major weaknesses in the measure remained. First, it was impossible to determine whether gender responses were made due to the salience of this dimension for the child, or whether the

child was simply unaware of or unable to comprehend the other available cues of prop, facial expression, or body stance. Second, the male and female portions of the preference measure were administered on the basis of the child's gender, assuming that all boys prefer to affiliate with males and all girls prefer to alliliate with females. Given that some children could have had an opposite gender preference, administration of the male version of the test to all boys and the female version of the test to all girls could have introduced noise into the data.

Thus, it was decided to develop a set of seven items to assess the child's awareness of the nongender dimension as well as his/her sex preference. For each of these items, the child was asked an affiliation question such as "Who would you like to play cards with?" and was given four possible choices, one of which included the child's preferred sex as well as the relevant prop. Thus, for the aforementioned item, the child would be given the choice of a man holding a deck of cards, a woman holding a deck of cards, a man without cards, and a woman without cards. It was expected that an examination of the child's choices across these seven items would enable a determination of his/her awareness of the nongender dimension and gender preference.

Sample 2. A second sample of preschool children was obtained in order to 1) examine the distribution of responses and the internal consistency within an additional sample, 2) examine test-retest reliability, and 3) pilot the new set of seven "diagnostic" items that had been designed to assess the child's awareness of prop and gender preference. The sample consisted of 16 children ranging in age from three to six (Mean age = 58.63 months) attending a preschool program serving a middle class population in a large Canadian city. The IQs of children in this sample, as assessed by the Peabody Picture Vocabulary Test, ranged from 80 to 127 (Mean IQ = 104).

Children were administered the 12 classification, seven "diagnostic", and five preference items two times, separated by a period of three weeks. The male version of the preference measure was given to all children choosing a greater number of males than females on the diagnostic items and the female version was administered to children choosing a greater number of females on the diagnostics.

The distribution of gender, nongender and random responses for each item was quite similar to that obtained in the first sample, with the majority of responses to most items being made on the basis of gender. Once again, however, most items

displayed some degree of variability between gender and nongender responses. Number of random responses on the preference measure continued to be higher than that obtained for the classification items. Examination of internal consistency using Chronbach's alpha revealed coefficients of .93 and .46 for the classification and preference measures, respectively. Test-retest agreement was found to be 88% on the classification items and 68% on the preference items.

Results obtained from use of the diagnostic items revealed that children who classified by nongender cues on the classification items and thus, were clearly able to sort on the basis of such cues, often did not make a majority of prop responses on the diagnostics. It is possible that these items, which required children to take account of two dimensions simultaneously, were too difficult for this young sample. Thus, it was decided to develop two separate sets of items, one to assess the child's awareness of prop and one to assess gender preference.

The prop awareness items developed were identical in format to the classification items, except that all photographs within a particular item contained individuals of the same gender. Thus, the nongender dimension was the only possible one on which to

categorize the information. Six such items were developed. In addition, eight items were developed in order to assess the child's gender preference. For each of these items, the child was asked who they would rather play with and was given a choice of a male or a female, engaged in the same activity. Finally, a few of the classification and affiliation preference items were modified slightly in order to decrease the number of random responses or increase the variability in terms of gender versus nongender choices.

Sample 3. A final sample of preschool children was administered the modified form of the classification and preference items as well as the newly developed prop awareness and gender preference items. This sample consisted of 50 children between the ages of three and a half and six (Mean age = 57 months) attending a half-day university-based nursery school program located within a small city in the northeastern United States. Children came from predominantly middle class families, and exhibited IQs on the Peabody Picture Vocabulary Test that ranged from 87 to 141 (Mean IQ = 114). Distribution of gender, nongender, and random responses on all items was judged to be acceptable. As in previous samples, the majority of choices on all items consisted of gender responses. Examination of internal

consistency by means of Chronbach's alpha revealed coefficients of .88 and .75 for the classification and affiliation measures, respectivaly. An examination of responses to prop awareness items revealed that all of the children who had made frequent prop choices on the classification items were able to correctly respond to at least four out of the six prop awareness items.

Although a total of 87 children ranging in age from three to six had been employed for purposes of measure development, an additional sample was needed in order to clearly assess developmental patterns in gender-based categorization and affiliation as the three samples had each been administered a slightly different version of the test and an insufficient number of three and six year old children were available within these preschool samples to enable a full analysis of age-related patterns. Thus, the present investigation was conducted, employing a larger sample of children between the ages of three and seven. The results of the present investigation are based upon use of the measure in the form that was employed within this final sample of preschool children.

Appendix III

Description of Classification Items

	Standard	Three Choices
Item 1.	Man with tools	Woman reading Man with bat Woman hammering
Item 2.	Woman with hands on hips	Man with hands on hips Man with hands at sides Woman with hands at sides
Item 3.	Woman with fists up	Man with fists up Woman with hands on hips Man with hands on hips
Item 4.	Woman eating cookie	Man reading newspaper Woman holding hammer Man eating apple
Item 5.	Man holding box	Woman holding box Man reading book Woman playing guitar
Item 6.	Man with broom	Woman reading book Man with bat Woman with broom and bucket
Item 7.	Woman knitting	Woman playing cards Man knitting Man playing guitar
Item 8.	Man playing cards	Woman playing cards Man drinking from a cup Woman reading book

Item 9.	Woman with broom and bucket	Woman playing cards Man with bucket, scrubbing floor Man playing guitar
Item 10.	Woman with catcher's mitt	Man reading book Woman with broom Man with catcher's mitt and bat
Item 11.	Woman standing behind chair	Man standing behind chair Man standing Woman standing
Item 12.	Man holding frying pan	Man using arm exerciser Woman holding a pot Woman reading

Appendix IV

Description of Prop Awareness Items

	Standard	Three Choices
Item 1.	Man reading book	Man with bat Man reading book Man playing guitar
Item 2.	Man with bat	Man with bat Man reading book Man using arm exerciser
Item 3.	Man sitting	Man standing Man sitting Man standing
Item 4.	Woman playing guitar	Woman with pot Woman playing guitar Woman playing cards
Item 6.	Woman smiling	Woman frowning Woman smiling Woman frowning

Appendix V

Description of Affiliation Items

Question	Male Preference Form	Female Preference Form
1. Who would you pick to go to the zoo with?	Woman smiling (P)[a] Man frowning (S) Woman frowning (R)	Man smiling (P) Man frowning (R) Woman frowning (S)
2. Who would you pick to go sled riding with?	Man with arms folded (S) Woman with farm animals (P) Woman with arms folded (R)	Man with arms folded (R) Man with farm animals (P) Woman with arms folded (S)
3. Who would you invite to a party?	Man standing (S) Woman standing (R) Woman playing guitar (P)	Man standing (R) Woman standing (S) Man playing guitar (P)
4. Who would you pick for a friend?	Woman standing (R) Woman and stuffed toy (P) Man standing (S)	Woman standing (S) Man and stuffed toy (P) Man standing (R)
5. Who would you pick to sing a song with?	Woman and toy house (P) Woman standing (R) Man standing (S)	Man and toy house (P) Woman standing (S) Man standing (R)

[a] Letters in parentheses denote the scoring of each response. That is, P signifies prop response, S signifies sex response and R signifies random response.

Appendix VI

Frequency of Male and Female Responses to Sex Preference Items by Boys and Girls

	Boys		Girls	
Item Number	Male Response	Female Response	Male Response	Female Response
1	59	16	18	54
2	47	28	28	44
3	59	16	40	32
4	45	30	16	56
5	50	25	28	44
6	48	27	17	55
7	49	26	23	49
8	52	23	26	46

Appendix VII

Questionnaire Assessing Parental Report of Child's Play Activities[a]

Please put a check mark in the first column next to each of the following toys and activities that are available to your child in the home. Following this, please rate the frequency with which your child plays with each of these toys in a typical week by using the five-point "Frequency Scale" that is shown below. Thus, if your child almost never plays with a particular toy, you would mark a "1" in the second column next to that toy. If, however, your child plays with a particular toy very frequently, you would mark a "5" in the second column next to that toy. You need only rate those toys that you have indicated are available in the home.

Frequency Scale:

1 - Rarely or Never. Although my child occasionally plays with the toy, he or she will not play with it in a typical week.k

2 - Once in Awhile. Plays with the toy at some point during one day of a typical week.

3 - Sometimes. Plays with the toy at some point during approximately two or three days in a typical week.

4 - Often. Plays with the toy at some point during approximately four or five days in a typical week.

5 - Very Often. Plays with the toy at some point during six or seven days of a typical week.

	Name of Toy or Activity	Place a check in this column if the toy is available in the home	Using the Frequency Scale rate how often your child plays with this toy
M	Blocks	---	---
F	Books	---	---
F	Toy telephone	---	---
F	Musical Instruments	---	---
F	Jump Rope	---	---
F	Dancing	---	---
M	Trucks, Cars, Trains and Airplanes	---	---
F	Toy ironing board and iron	---	---
F	Painting and Drawing Materials	---	---
F	Sewing (Toy or Real Materials)	---	---
M	Baseball bat	---	---
M	Checkers or Chess	---	---
M	Construction Materials (e.g. Tinker Toys)	---	---
M	Climbing and Riding Toys	---	---
F	Toy Kitchen Utensils and Appliances	---	---

M	Puzzles	---	---
F	Makeup Play (toy or real)	---	---
M	Microscope	---	---
M	Computerized Games	---	---
M	Doctor's Kit	---	---
M	Tools (toy or real)	---	---
M	Toy Soldier Set	---	---
M	Star Wars Characters	---	---
M	Water Pistol	---	---
M	Football	---	---
M	Model Building Kits (e.g. cars, boats)	---	---
F	Dolls and Accessories	---	---
M	Guns	---	---
F	Nurse's Kit	---	---

[a] Toys preceded by an M are those considered to be stereotypically masculine based upon the literature. Those preceded by an F are considered to be stereotypically feminine. This information was not included in the questionnaires sent to parents.

Appendix VIII

T-tests to Determine Toys to Include in Male- and Female-Preferred Activity Scales

Toy or Activity	Boys Mean (N)	Girls Mean (N)	t value	Scale[a]
Blocks	2.40 (47)	2.27 (44)	.49	
Books	4.40 (52)	4.40 (48)	.05	
Toy Telephone	1.44 (43)	2.02 (44)	2.52****	F
Musical Instruments	2.86 (50)	2.76 (49)	.39	
Jump Rope	1.29 (28)	2.19 (42)	3.71****	F
Dancing	3.25 (4)	2.74 (23)	.57	
Trucks, Cars, Trains, and Airplanes	4.09 (53)	2.11 (46)	8.35****	M
Toy Ironing Board and Iron	1.20 (5)	1.44 (16)	.79	
Painting and Drawing Materials	3.83 (52)	4.18 (49)	1.77**	F
Sewing	1.33 (33)	1.92 (41)	2.76****	F
Baseball Bat	2.52 (42)	1.66 (32)	3.16****	M
Checkers or Chess	2.09 (43)	1.80 (40)	1.18	
Construction Materials	3.45 (51)	2.74 (47)	2.96****	M
Climbing and Riding Toys	3.75 (51)	3.34 (47)	1.44*	M
Kitchen Toys	1.80 (25)	2.63 (44)	2.99****	F
Puzzles	2.63 (48)	2.74 (46)	.43	

Makeup Play	1.89 (18)	2.71 (35)	2.41***	F
Microscope	1.50 (16)	1.14 (7)	1.43	
Computerized Games	2.94 (35)	2.32 (25)	1.83**	M
Doctor's Kit	1.68 (37)	2.33 (39)	2.57****	
Tools	2.33 (45)	1.76 (33)	2.34***	M
Soldier Set	2.33 (9)	1.00 (4)	3.58****	
Star Wars Characters	3.22 (37)	1.38 (21)	6.95****	M
Water Pistol	2.23 (40)	1.32 (34)	3.91****	M
Football	2.24 (21)	1.38 (21)	2.82****	
Model Building	2.13 (23)	1.23 (13)	3.18****	
Dolls	1.71 (31)	3.57 (46)	6.19****	F
Guns	2.94 (18)	1.47 (15)	4.42****	
Nurse's Kit	1.50 (2)	2.86 (7)	2.00*	

[a] F = item included in female-preferred activity scale
M = item included in male-preferred activity scale

$^{****}p<.01$

$^{***}p<.05$

$^{**}p<.10$

$^{*}p<.15$

Appendix IX

Questionnaire Assessing Parental Reactions to Sex-Typed Play Activities

Here is another list of the toys which you just rated. For each item, try to imagine how you would react if that toy or activity was your child's favorite. Rate each activity on the degree to which you would be pleased or disappointed by using the 7-point Reaction Scale shown below. Please rate each of the toys on this scale, regardless of whether or not it is available in the home.

Since this questionnaire is being filled out by parents of children between the ages of 3 and 8, it is likely that some of these activities will not seem appropriate to your child's age. Please try to imagine what your reaction would be if your child played with that toy during the age period when it would be most appropriate for him/her to do so.

Reaction Scale:[a]

1 - I would be extremely disappointed and concerned if this were my child's favorite activity. I would probably discourage frequent play in this activity.

2 - I would be moderately disappointed and concerned if this were my child's favorite activity. I might discourage frequent play in this activity.

3 - I would be slightly disappointed and concerned if this were my child's favorite activity. However, I would probably not discourage frequent play in this activity.

4 - I would be neither disappointed nor pleased if this were my child's favorite activity. My reaction would be neutral.

5 - I would be slightly pleased if this were my child's favorite activity. However, I would probably not actively encourage frequent play in this activity.

6 - I would be moderately pleased if this were my child's favorite activity. I might encourage frequent play in this activity.

7 - I would be extremely pleased if this were my child's favorite activity. I would probably encourage frequent play in this activity.

[a] The list of activities shown in Appendix VII followed these instructions.

Appendix X

T-tests to Determine Toys Reacted to Differentially by Parents of Boys and Girls

Toy or Activity[a]	Mean Parents of Boys (N=53)	Mean Parents of Girls (N=49)	t value
Blocks	5.49	5.12	1.36
Books	6.66	6.64	.12
Toy Telephone	4.25	4.18	.26
Musical Instruments	6.34	6.30	.22
Jump Rope	4.58	4.72	.46
Dancing (F)	5.00	5.82	3.09****
Trucks, Cars, Trains, Airplanes (M)	5.15	4.28	3.82****
Toy Ironing Board and Iron	3.55	3.74	.73
Painting and Drawing Materials	6.45	6.32	.76
Sewing (F)	4.09	5.16	3.61****
Baseball Bat (M)	5.49	4.86	2.61****
Checkers or Chess (M)	6.00	5.50	2.14***
Construction Materials (M)	6.15	5.86	1.55
Climbing and Riding Toys (M)	5.62	5.30	1.44*
Kitchen Toys (F)	4.32	4.80	1.88**
Puzzles	6.06	5.94	.58

Makeup Play	3.79	3.70	.30
Microscope (M)	5.96	5.62	1.57•
Computerized Games (M)	5.60	5.18	1.55•
Doctor's Kit	5.08	5.08	.02
Tools (M)	5.51	5.06	1.96•••
Soldier Set	3.64	3.26	1.41
Star Wars Characters (M)	3.89	3.20	2.43•••
Water Pistol	2.75	2.68	.28
Football (M)	4.65	3.93	2.50•••
Model Building	5.66	5.46	.92
Dolls (F)	3.60	5.10	5.81••••
Guns	2.04	1.86	.77
Nurse's Kit (F)	3.85	4.39	2.04••

[a] F = Item included in scale reflecting mother's reaction to her child's play with girls' toys.

M = Item included in scale reflecting mother's reaction to her child's play with boys' toys.

•••• $p<.01$

••• $p<.05$

•• $p<.10$

• $p<.15$

Appendix XI

Questionnaire Assessing Parental Reactions to Sex-Typed Behaviors

The following is a list of behaviors and character traits that are often seen in children. For each item, use the seven-point scale shown below in order to indicate whether or not you would like your child to display this trait and how important it is to you that he/she does (or does not). Please indicate your ratings by writing the number you have chosen from the scale in the column next to the trait or behavior. Please rate all of the items, even those traits and behaviors that your child does not typically engage in.

1 - I would like my child to display this trait and it is extremely important to me that he/she do so

2 - I would like my child to display this trait and it is moderately important to me that he/she do so.

3 - I would like my child to display this trait and it is slightly important to me that he/she do so.

4 - It does not matter to me whether or not my child displays this trait.

5 - I would not like my child to display this trait and it is slightly important to me that he/she does not do so.

6 - I would not like my child to display this trait and it is moderately important to me that he/she does not do so.

7 - I would not like my child to display this trait and it is extremely important to me that he/she does not do so.

Behavior or Trait[a]	Rating
M Is adventurous as opposed to being cautious	---
F Likes to dress up in nice clothes	---

M Shouts loudly when playing ---

F Enjoys arts and music a lot ---

M Acts like a leader among his/her peers ---

M Is good at sports ---

M Tends to come home with dirty clothes after playing ---

M Fights back if other children are physically aggressive towards him/her ---

F Becomes very shy when meeting new people ---

F Is somewhat insecure about his/her abilities and needs a lot of approval from you ---

F Often submits to decisions of other children ---

M Hates to lose a game or have other children do better than him/her ---

M Becomes physically aggressive if teased by other children ---

F Expresses tender feelings towards you ---

F Polite - almost always remembers to say please and thank you ---

F Is fairly quiet when playing with other children ---

M Is very active - likes to climb, run and jump ---

M Likes math and science very much ---

F Likes to be babied and have things done for him/her ---

F Often winds up crying when playing with others ---

[a] Behaviors preceded by an M are those that are considered to be stereotypically masculine and those preceded by an F are considered to be stereotypically feminine. This information was not included in the questionnaires sent to parents.

Appendix XII

T-tests to Determine Behaviors Reacted to Differentially by Parents of Boys and Girls

Behavior	Means Parents of Boys (N=53)	Means Parents of Girls (N=49)	t value
Adventurous	4.96	5.29	1.25
Dressing up in nice clothes	4.87	5.14	1.43
Shouts loudly when playing	2.76	2.82	.25
Enjoys art and music	5.92	5.72	.98
Acts like a leader with peers	4.91	5.42	2.39***
Good at sports	5.40	5.20	.96
Comes home dirty after play	3.98	3.90	.62
Fights back when peers are physically aggressive towards him/her	4.68	5.40	2.39
Shy with new people	2.55	2.78	1.21***
Insecure about his/her abilities	3.13	3.14	.04
Submits to decisions of peers	2.65	2.28	1.82**
Hates to lose a game	2.28	2.20	.37
Physically aggressive if teased by other children	2.15	2.10	.22
Expresses tender feelings towards you	6.49	6.42	.44
Polite	6.30	6.1	1.12

Fairly quiet when playing with other children	4.23	4.1	.55
Very active	5.17	5.38	.84
Likes math and science	5.30	5.40	.46
Likes to be babied	2.53	2.56	.13
Often cries when playing with others	1.92	1.76	.94

•••• $p<.01$

••• $p<.05$

•• $p<.10$

• $p<.15$

Appendix XIII

Degree of Parental Involvement in Employment Activities Outside the Home

For each of the following periods from your child's birth to the present, please check the appropriate column to indicate whether you had been unemployed, employed part time, or employed full time.

	unemployed		employed part-time		employed full time	
	self	spouse	self	spouse	self	spouse
During the first year	---	---	---	---	---	---
From first to second birthday	---	---	---	---	---	---
From second to fifth birthday	---	---	---	---	---	---
From fifth to seventh birthday	---	---	---	---	---	---
Since the seventh birthday	---	---	---	---	---	---

Appendix XIV

The Orlofsky Sex Role Behavior Scale

Please use the following 5-point scale to rate the list of household responsibilities according to how characteristic they are of you compared to your spouse. That is, try to think which of you takes primary responsibility for each of the tasks. If you no longer live with your spouse, pplease use the scale to describe the division of responsibilities as it existed when you were together. If any of the tasks do not apply, please rate them according to who you imagine would take primary responsibility for the chore.

A Much more characteristic of my spouse

B Slightly more characteristic of my spouse

C Equally characteristic of my spouse and me

D Slightly more characteristic of me

E Much more characteristic of me

Household Responsibilities[a]

Housework (MF)

Washing the car (M)

Yardwork (MF)

Opening the wine (M)

Vacuuming (MF)

Dusting (MF)

Cooking (F)

Emptying the garbage (MF)

Doing the barbequing (MF)

Cleaning the bathroom (MF)

Mowing the lawn (MF)

Adjusting the thermostat (M)

Shoveling snow (MF)

Painting the inside of the house (MF)

Tuning in a hard to get T.V. station (M)

Repairing household appliances (MF)

Steam cleaning the carpets (F)

Doing laundry (MF)

Writing items needed on the shopping list (F)

Making travel arrangements for vacations (M)

Changing fuses or resetting circuit breakers (MF)

Taking pictures at family household events (M)

Buying groceries (F)

Child Care Responsibilities

Child care (F)

Taking children along when going on errands (F)

Explaining the facts of life to female children (MF)

Infant care (MF)

Teaching one's children how to drive (M)

Playing catch with children (M)

Buying clothes for the children (MF)

Giving the child a hug (F)

Making sure the children get medical and dental care (F)

Taking children to a ball game (M)

Getting the children breakfast (MF)

Reading a bed time story to children (F)

Giving the children their allowance (M)

Regulating what the children eat (F)

Talking about the good old days with children (M)

Talking things over with one's son when he's having problems (M)

Disciplining male children (M)

Letting children learn by their mistakes (M)

Dealing with the neighbor whose window the child has broken (M)

Playing with male children (M)

Playing with female children (F)

Explaining the facts of life to male children (MF)

Going fishing with children (MF)

Helping the children put together unassembled toys (M)

Spending a good deal of time with the children (F)

Dealing with a child's teacher when there's a problem at school (F)

Taking children to church or synagogue (F)

Talking things over with one's daughter when she's having problems (F)

Dealing with the police when the child breaks the law (MF)

Going to a P.T.A. meeting (F)

[a] M = item on the male valued scale
F = item on the female valued scale
MF = item on the sex specific scale

Appendix XV

Number of Questionnaires Returned at Each Level of Age and Sex

	Three		Four		Five		Six		Seven	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mother Only N=80	7	8	8	12	7	5	10	4	10	9
Mother and Father (N=22)	0	1	1	2	4	3	1	4	5	1
Father Only (N=7)	1	0	1	0	0	0	1	1	0	3
None Returned (N=38)	7	5	5	1	4	6	3	6	0	1

Appendix XVI

Multiple Regression Analyses to Determine the Degree to which Gender-based Classification Moderates the Relationship Between Parent and Child Sex Typing

Appendix XVIa.

Regressions Employing Mothers' Reaction to Toys as a Predictor of Childrens' Degree of Sex Typing on Laboratory Measures [a,b]

Boys (N= 42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.65	.52E-01	.42	.42	29.56***
2. GBC (s)	-.02	-.64	.43	.01	.54
3. MRT (s)	.18	-2.29	.44	.01	.66
4. Age X MRT (h)	.28	.29	.44	.00	.01
5. GBC X MRT (h)	.22	4.39	.45	.01	.63
6. Age X GBC (h)	.09	.84E-01	.46	.01	.42
7. Age X GBC X MRT (h)	.25	-.50E-01	.47	.01	.58

Appendix XVIa. continued

Girls (N = 41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.55	.12	.30	.30	16.70•••
2. MRT (s)	.11	4.79	.33	.03	1.93
3. GBC (s)	-.21	.61	.34	.00	.15
4. Age X MRT (h)	.16	-.50	.34	.00	.18
5. GBC X MRT (h)	-.12	-7.29	.44	.10	6.29••
6. Age X GBC (h)	-.12	-.77E-01	.45	.01	.84
7. Age X GBC X MRT (h)	-.10	.74E-01	.46	.00	.26

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBC = gender-based classification; MRT = mother's reaction to toys

••• $p<.0001$
•• $p<.02$
• $p<.05$

Appendix XVIb.

Regressions Employing Mothers' Reaction to Toys as a Predictor of Childrens' Degree of Sex-typed Play at Home[a,b]

Boys (N = 42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. GBC (s)	-.07	-.66	.01	.01	.22
2. MRT (s)	-.04	-.67	.01	.00	.17
3. Age (s)	.01	.80E-01	.02	.01	.42
4. Age X MRT (h)	-.07	-.32E-01	.03	.01	.46
5. GBC X MRT (h)	-.11	1.62	.04	.01	.44
6. Age X GBC (h)	-.03	.88E-01	.15	.11	4.33*
7. Age X GBC X MRT (h)	-.11	-.26E-01	.17	.02	.75

Appendix XVIb. continued

Girls (N = 41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.12	.33E-01	.02	.02	.60
2. GBC (s)	-.10	.37	.02	.00	.05
3. MRT (s)	.00	-.65	.02	.00	.04
4. Age X MRT (h)	.00	.10	.02	.00	.13
5. GBC X MRT (h)	-.14	4.15	.09	.07	2.76
6. Age X GBC (h)	-.15	-.48E-01	.20	.11	4.64•
7. Age X GBC X MRT (h)	-.18	-.71E-01	.23	.03	1.31

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBC = gender-based classification; MRT = mother's reaction to toys.

••• $p<.0001$
•• $p<.02$
• $p<.05$

Appendix XVIc.

Regressions Employing Mothers' Scores on the Orlofsky Sex-Role Behavior Scale as a Predictor of Childrens' Degree of Sex Typing on Laboratory Measures [a,b]

Boys (N = 42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.65	.93E-01	.42	.42	29.56***
2. Orlofsky (s)	-.23	1.07	.43	.01	.60
3. GBC (s)	-.02	-.21	.44	.01	.56
4. Age X Orlofsky (h)	-.20	-.13	.44	.00	.07
5. GBC X Orlofsky (h)	-.22	-2.47	.45	.00	.14
6. Age X GBC (h)	.09	.34E-01	.45	.01	.41
7. Age X GBC X Orlofsky (h)	-.21	.28E-01	.46	.01	.32

Appendix XVIc. continued

Girls (N = 41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.55	.13	.30	.30	16.70***
2. GBC (s)	-.21	.90	.31	.01	.66
3. Orlofsky (s)	-.06	-1.13	.31	.00	.26
4. Age X Orlofsky (h)	-.03	.11	.32	.00	.04
5. GBC X Orlofsky (h)	-.03	1.37	.34	.02	.89
6. Age X GBC (h)	-.12	-.12	.40	.06	3.28
7. Age X GBC X Orlofsky (h)	-.01	-.58E-02	.40	.00	.01

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = child's age; GBC = gender-based classification, Orlofsky = mother's score on the Orlofsky Sex Role Behavior Scale.

*** $p<.0001$
** $p<.02$
* $p<.05$

Appendix XVId.

Regressions Employing Mothers' Scores on the Orlofsky Sex-Role Behavior Scale as a Predictor of Childrens' Degree of Sex-Typed Play at Home [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Orlofsky (s)	-.17	-.55	.03	.03	1.26
2. GBC (s)	-.07	-.43	.03	.00	.17
3. Age (s)	.01	-.22E-01	.04	.00	.05
4. Age X Orlofsky (h)	-.18	.65E-01	.04	.00	.05
5. GBC X Orlofsky (h)	-.21	1.32	.06	.02	.86
6. Age X GBC (h)	-.03	.54E-01	.14	.08	8.23
7. Age X GBC X Orlofsky (h)	-.23	-.19E-01	.16	.02	.72

Appendix XVId. continued

Girls (N= 44)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Orlofsky (s)	.15	-.86	.02	.02	.92
2. Age (s)	.12	.30E-01	.04	.02	.74
3. GBC (s)	-.10	.51	.04	.00	.04
4. Age X Orlofsky (h)	.22	.12	.10	.06	2.47
5. GBC X Orlofsky (h)	.10	-1.08	.15	.05	2.10
6. Age X GBC (h)	-.15	-.75E-01	.34	.19	9.57••
7. Age X GBC X Orlofsky (h)	.17	.30E-01	.37	.03	1.71

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = chil's age; GBC = gender-based classification; Orlofsky = Mother's score on Orlofsky Sex Role Behavior Scale.

••• $p<.0001$
•• $p<.02$
• $p<.05$

Appendix XVIe.

Regressions Employing Mothers' Employment History as a Predictor of Childrens' Degree of Sex Typing on Laboratory Measures [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.65	.87E-01	.42	.42	29.56***
2. Employment (s)	.10	.37E-01	.44	.02	1.31
3. GBC (s)	-.02	-.47	.45	.01	.40
4. Age X Employment (h)	.08	-.14E-01	.45	.00	.00
5. GBC X Employment (h)	.27	-.78	.53	.08	6.55**
6. Age X GBC	.09	.65E-01	.55	.02	1.33
7. Age X GBC X Employment (h)	.27	.19E-01	.56	.01	.55

Appendix XVIe. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.55	.13	.30	.30	16.70***
2. GBC (s)	-.21	.89	.31	.01	.66
3. Employment (s)	.08	.66	.31	.00	.05
4. Age X Employment (h)	.07	-.81E-01	.31	.00	.02
5. GBC X Employment (h)	.00	-.71	.33	.02	.95
6. Age X GBC (h)	-.12	-.12	.38	.05	2.85
7. Age X GBC X Employment (h)	-.03	.69E-02	.38	.00	.05

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = child's age; GBC = gender-based classification; Employment = Degree to which mother has been involved in employment activities outside the home over the course of the child's life

*** $p<.0001$
** $p<.02$
* $p<.05$

Appendix XVIf.

Regressions Employing Mothers' Employment History as a Predictor of Childrens' Degree of Sex-Typed Play at Home [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Employment (s)	.08	.50	.01	.01	.23
2. GBC (s)	-.07	-.51	.01	.01	.27
3. Age (s)	.01	-.23E-01	.07	.06	2.90
4. Age X Employment (h)	.06	-.70E-01	-.08	.01	.25
5. GBC X Employment (h)	.26	-1.62	.16	.08	3.22
6. Age X GBC (h)	-.03	.64E-01	.22	.06	2.57
7. Age X GBC X Employment (h)	.29	.25E-01	.32	.10	4.85*

Appendix XVIf. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Employment (s)	-.23	.23	.05	.05	2.10
2. Age (s)	.12	.33E-01	.08	.03	1.26
3. GBC (s)	-.10	.41	.08	.00	.09
4. Age X Employment (h)	-.20	-.35E-01	.09	.01	.38
5. GBC X Employment (h)	-.28	-.53	.12	.03	1.10
6. Age X GBC (h)	-.15	-.61E-01	.24	.12	5.31•
7. Age X GBC X Employment (h)	-.26	.61E-02	.25	.01	.24

Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

Age = child's age; GBC = gender-based classification; Employment = Degree to which mother has been involved in employment activities outside the home throughout the child's life.

••• $p<.0001$
•• $p<.02$
• $p<.05$

Appendix XVII

Multiple Regression Analyses to Determine the Degree to which Gender-based Affiliation Moderates the Relationship Between Parent and Child Sex Typing

Appendix XVIIa.

Regressions Employing Mothers' Reaction to Toys as a Predictor of Childrens' Degree of Sex Typing on Laboratory Measures [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.65	.54E-01	.42	.42	29.56***
2.GBA (s)	.64	.37	.57	.14	12.88**
3. MRT (s)	.18	-.90	.57	.00	.18
4.Age X MRT (h)	.28	.16	.57	.00	.12
5.GBA X MRT (h)	.44	1.55	.57	.00	.08
6.Age X GBA (h)	.70	.28E-01	.57	.00	.00
7.Age X GBA X MRT (h)	.47	-.28E-01	.57	.00	.09

Appendix XVIIa. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.55	.80E-01	.30	.30	16.70***
2. GBA (s)	.26	.60	.36	.06	3.32
3. MRT (s)	.11	-2.15	.37	.01	1.11
4.Age X MRT (h)	.16	.48	.38	.01	.17
5.GBA X MRT (h)	.00	4.81	.40	.02	1.50
6.Age X GBA (h)	.41	-.40E-01	.41	.01	.24
7.Age X GBA X MRT (h)	.05	-.12	.41	.00	.21

[a] Letters in parenthesis next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBA = gender-based affiliation; MRT = mother's reaction to toys

*** $p < .0001$

** $p < .02$

* $p < .05$

Appendix XVIIb.

Regressions Employing Mothers' Reaction to Toys as a Predictor of Childrens' Degree of Sex-Typed Play at Home [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. GBA (s)	.12	.52	.01	.01	.60
2. MRT (s)	-.04	.92	.02	.01	.14
3. Age (s)	.01	.19E-01	.02	.00	.09
4.Age X MRT (h)	-.07	-.14	.04	.02	.94
5.GBA X MRT (h)	-.01	2.27	.05	.01	.01
6.Age X GBA (h)	.09	-.63E-01	.05	.00	.27
7.Age X GBA X MRT (h)	-.03	.31E-01	.06	.01	.39

Appendix XVIIb. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.12	.32E-01	.02	.02	.60
2. GBA (s)	.04	.69	.02	.00	.06
3. MRT (s)	.00	-1.81	.03	.01	.19
4.Age X MRT (h)	.00	.26	.03	.00	.00
5.GBA X MRT (h)	.04	9.50	.03	.00	.17
6.Age X GBA (h)	.00	-.98E-01	.16	.13	5.54*
7.Age X GBA X MRT (h)	.01	-.13	.20	.04	1.42

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBA = gender-based affiliation; MRT = mother's reaction to toys.

* $p < .05$

Appendix XVIIc.

Regressions Employing Mothers' scores on the Orlofsky Sex-Role Behavior Scale as a Predictor of Childrens' Degree of Sex Typing on Laboratory Measures [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.65	.50E-01	.42	.42	29.56***
2. GBA (s)	.64	.48	.57	.15	12.88**
3. Orlofsky (s)	-.23	-.39	.57	.00	.11
4.Age X Orlofsky (h)	-.20	-.36E-01	.57	.00	.41
5.GBA X Orlofsky (h)	-.10	11.58	.63	.06	5.35*
6.Age X GBA (h)	.70	.21E-01	.63	.00	.31
7.Age X GBA X Orlofsky (h)	-.11	-.12	.65	.02	2.21

Appendix XVIIc. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.55	.82E-01	.30	.30	16.70•••
2. GBA (s)	.26	.56	.36	.06	3.32
3. Orlofsky (s)	-.06	-1.40	.36	.00	.01
4.Age X Orlofsky (h)	-.03	.28	.36	.00	.19
5.GBA X Orlofsky (h)	-.10	7.00	.37	.01	.35
6.Age X GBA (h)	.41	-.38E-01	.37	.00	.18
7.Age X GBA X Orlofsky (h)	-.10	-.14	.40	.03	1.57

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBA = gender-based affiliation; Orlofsky = mother's score on the Orlofsky Sex Role Behavior Scale

••• $p < .0001$

•• $p < .02$

• $p < .05$

Appendix XVIId.

Regressions Employng Mothers' Scores on the Orlofsky Sex-Role Behavior Scale as a Predictor of Childrens' Degree of Sex-Typed Play at Home [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Orlofsky (s)	-.18	.54	.03	.03	1.28
2. GBA (s)	.12	.23	.04	.01	.28
3. Age (s)	.01	-.36E-02	.04	.00	.20
4.Age X Orlofsky (h)	-.18	-.11	.05	.01	.14
5.GBA X Orlofsky (h)	-.14	.43	.07	.02	.95
6.Age X GBA (h)	.09	-.19E-01	.07	.00	.13
7.Age X GBA X Orlofsky (h)	-.14	.41E-02	.00	.01	

Appendix XVIId. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Orlofsky (s)	.15	-1.72	.02	.02	.91
2. Age (s)	.12	.30E-01	.04	.02	.74
3. GBA (s)	.04	.80	.04	.00	.06
4.Age X Orlofsky (h)	.22	.29	.11	.07	2.56
5.GBA X Orlofsky (h)	.20	4.56	.13	.02	.77
6.Age X GBA (h)	.00	-.11	.26	.13	6.37*
7.Age X GBA X Orlofsky (h)	.22	-.71E-01	.32	.06	2.91

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarhical (h) fashion.

[b] Age = Child's age; GBA = gender-based affiliation; Orlofsky = mother's score on the Orlofsky Sex Role Behavior Scale.

* $p < .05$

Appendix XVIIe.

Regressions Employing Mothers' Employment History as a Predictor of Childrens' Degree of Sex Typing on Laboratory Measures [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.65	.71E-01	.42	.42	29.56***
2. GBA (s)	.64	.61	.57	.14	12.88**
3. Employment (s)	.10	.51	.59	.02	2.42
4. Age X Employment (h)	.08	-.75E-01	.60	.01	.36
5.GBA X Employment (h)	.18	.78	.62	.02	1.94
6.Age X GBA (h)	.70	-.11E-01	.62	.00	.01
7.Age X GBA X Employment (h)	.14	-.17E-02	.62	.00	.01

Appendix XVIIe. continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. Age (s)	.55	.84E-01	.30	.30	16.70***
2. GBA (s)	.26	.88	.36	.06	3.32
3. Employment (s)	.08	-.30	.36	.00	.04
4.Age X Employment (h)	.07	.20E-01	.36	.00	.01
5.GBA X Employment (h)	.15	2.21	.37	.01	.60
6.Age X GBA (h)	.41	-.72E-01	.37	.00	.21
7.Age X GBA X Employment (h)	.14	-.21E-01	.37	.00	.14

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBA = gender-based affiliation; Employment = Degree to which mother has been involved in employment activities outside the home over the course of the child's life.

*** $p < .0001$

** $p < .02$

* $p < .05$

Appendix XVIIf.

Regressions Employing Mothers' Employment History as a Predictor of Childrens' Degree of Sex-Typed Play at Home [a,b]

Boys (N=42)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1. GBA (s)	.12	.37	.01	.01	.60
2.Employment (s)	.08	.48	.02	.01	.29
3. Age (s)	.01	.80E-02	.02	.00	.11
4. Age X Employment (h)	.06	-.66E-01	.03	.01	.34
5. GBA X Employment (h)	.07	-1.01	.04	.01	.07
6.Age X GBA (h)	.09	-.41E-01	.06	.02	.78
7.Age X GBA X Employment (h)	.07	.15E-01	.07	.01	.47

Appendix XVIIf continued

Girls (N=41)

Predictor Variable	Zero-Order Correlation	Beta	R Squared	R Squared Change	F value of Beta
1.Employment (s)	-.23	-.12	.05	.05	2.11
2. Age (s)	.12	.35E-01	.08	.03	1.26
3. GBA (s)	.04	.87	.08	.00	.03
4.Age X Employment (h)	-.20	-.67E-02	.09	.01	.31
5.GBA X Employment (h)	-.06	.38	.13	.04	1.42
6.Age X GBA (h)	.00	-.12	.27	.14	6.52**
7.Age X GBA X Employment (h)	-.03	.15E-02	.27	.00	.01

[a] Letters in parentheses next to variable names indicate whether the variable was entered in a stepwise (s) or hierarchical (h) fashion.

[b] Age = Child's age; GBA = gender-based affiliation; Employment = Degree fo which mother has been involved in employment activities outside the home over the course of the child's life.

** $p < .01$