

The Role of Gender Constancy in Early Gender Development

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Kohlberg's (1966) hypothesis that the attainment of gender constancy motivates children to attend to gender norms was reevaluated by examining these links in relation to age. Ninety-four 3- to 7-year-old children were interviewed to assess whether and how constancy mediates age-related changes in gender-related beliefs. As expected, results indicated a general pattern of an increase in stereotype knowledge, the importance and positive evaluation of one's own gender category, and rigidity of beliefs between the ages of 3 and 5. Moreover, the stability phase, rather than full constancy, mediated some of these relations. After age 5, rigidity generally decreased with age, with relations primarily mediated by consistency.

One of the most compelling yet controversial ideas in the gender literature is "gender constancy." As proposed by Kohlberg (1966), children's developing understanding of the permanence of categorical sex ("I am a girl and will always be a girl") is a critical organizer and motivator for learning gender concepts and behaviors. Slaby and Frey (1975) demonstrated that children move through a series of stages: first learning to identify their own and others' sex (basic gender identity or labeling), next learning that gender remains stable over time (stability), and finally learning that gender is a fixed characteristic that is not altered by superficial transformations in appearance or activities (consistency). Thus, children are thought to reach a full understanding of constancy once they recognize that they will always be the same sex, across time or change in situation (e.g., a boy who puts on a dress and a long-haired wig is still a boy even though he resembles a girl). These stages have been confirmed in other research, including cross-cultural studies (e.g., De Lisi & Gallagher, 1991).

Kohlberg's (1966) cognitive-developmental approach represented a bold departure from the dominant theories of gender development in the 1950s and 1960s. In contrast to Mischel's (1966) social learning theory, Kohlberg proposed that children's motivations to learn about gender are largely internally

generated rather than stimulated by external rewards or reprisals. According to Kohlberg, as children come to understand that their sex is permanent, mastery motivation leads them to seek information about gender and to conform to gender norms. Thus, higher levels of gender constancy should be associated with increased interest in and responsiveness to gender-related information and norms.

Indeed, as reviewed recently (Martin, Ruble, & Szkrybalo, 2002), many studies show positive relations between level of constancy and aspects of gender development, including selective attention to same-sex models (e.g., Slaby & Frey, 1975); same-sex activity, clothing, and peer preferences (e.g., Warin, 2000); gender stereotype knowledge (e.g., Coker, 1984); evaluative reactions to males and females (De Lisi & Johns, 1984); and responsiveness to gender cues (e.g., Zucker, Yoannidis, & Abramovitch, 2001). As Huston (1983) noted, however, there have been many mixed or null findings.

Inconsistencies across studies may occur for various reasons. First, relations in very young children may sometimes be misleading because many young children appear to show a phase of "pseudoconstancy" (Emmerich, Goldman, Kirsh, & Sharabany, 1977; Szkrybalo & Ruble, 1999; Wehren & De Lisi, 1983). According to this idea, many children answer all items of a forced-choice gender-constancy measure correctly, but they do so without really understanding the meaning of gender permanence. When asked to explain their answers, these pseudoconstant children do not provide constancy-relevant justifications for their responses (e.g., "It doesn't matter if [target boy] is wearing a dress; he'll

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always be a boy"). Instead, they tend to focus on irrelevant details (e.g., "He still has a boy's face") or show uncertainty. It is not surprising, then, that studies often indicate a dip in scores on forced-choice constancy questions appearing at approximately age 4 followed by a recovery in scores 1 or 2 years later. This dip corresponds to a disjunction between forced-choice responses and a particular kind of open-ended response, namely, social norm reasoning (e.g., "If Jack is wearing a dress, he must be a girl because boys don't wear dresses"). These findings suggest that in young children, examining only yes-or-no responses to constancy questions without looking at reasoning may overestimate their level of understanding, making it difficult to interpret relations with gender typing.

A second problem is that it remains unclear which stage of gender constancy drives children's reactions. In a recent review of the literature on relations between stage of gender constancy and responsiveness to gender-related information, gender consistency did not emerge as the crucial component (Ruble, Martin, & Berenbaum, 2006; see also Arthur, Bigler, & Ruble, 2006). Instead, such relations often involve earlier stages of understanding, either gender identity or gender stability. Thus, Kohlberg (1966) may have been right about the motivational importance of a firm gender identity for promoting gender differentiation, but this identity may emerge earlier than he thought.

A third problem is that gender development does not change in a linear fashion. For example, children's gender stereotypes appear to be held rigidly at approximately 5 years and then become more flexible (Signorella, Bigler, & Liben, 1993). The findings of a recent longitudinal study point to phase-like shifts in the rigidity of category-relevant beliefs and behaviors, moving from a beginning awareness, to rigidity, to flexibility (e.g., Trautner et al., 2005). Thus, it may be difficult to examine connections between gender-related beliefs and constancy across age because at some ages such beliefs are increasing in rigidity and at other ages they are decreasing.

Indeed, there has been theoretical debate about whether full constancy understanding should be associated with relatively high or low levels of rigidity. Kohlberg (1966) stated that gender identity can be a stable organizer of children's "psycho-sexual attitudes" only when they are "categorically certain of its unchangeability" (p. 95). One interpretation of Kohlberg's theory is that gender rigidity may result from a fear that participating in sex-atypical behavior might cause one to transform into the opposite sex (Huston, 1983). According to this perspective, understanding the permanence of gender should be associated with lower rigidity because children would

realize that gender norms could be violated without physical consequences. An alternative interpretation of Kohlberg's theory is that understanding the permanence of gender provides a critical motive for children to learn about and adhere to gender roles. From this perspective, full gender constancy attainment should be associated with higher rigidity, at least for a period of time (see Ruble et al., 2006, for a detailed discussion of these issues).

These alternative predictions are interesting in light of the literature on essentialistic thought (e.g., Gelman, 2003). Children's attempts to understand the implications of different essences are particularly important for social categories because individuals can belong to the categories and identify with them, and thus they have implications for ingroup and outgroup attitudes and behaviors. That is, it matters which features of categories are critically linked to such essences. For example, if children think that wearing pink, frilly dresses result from "girlness," boys should avoid them and girls should love them. Once children learn that such features are not fundamental to being a boy or a girl (i.e., the gender consistency stage), however, adherence to these more superficial aspects of the category can be relinquished. Bem (1989) made this argument for why it makes sense to teach young children that genitals, not appearance or activities, are the critical distinctions between males and females. If this is true, higher levels of consistency understanding should be associated with less rigidity, supporting Huston's (1983) view.

These observations suggest that a closer look at the effects of gender constancy is needed. This is important not only because of inconsistencies in prior research. Recent analyses of gender development have described a close connection between cognitive-developmental theory and other theories that emphasize the importance of children's emerging understanding of gender categories, namely, gender schema theories (e.g., Martin & Halverson, 1981) and social categorization theories (e.g., Bigler, 1995). These theories place emphasis on active, constructive processes connected with categorizing self and others, and they assert that such processes are different from more biological or environmental explanations of gender development (Liben & Bigler, 2002; Martin et al., 2002). The main focus of the present study is not which of these processes is more important; the importance of biological and environmental factors in gender development is indisputable. Rather, the focus of the present study is to determine whether something special might be contributed to our knowledge of gender development by more closely examining the effects of children's increased understanding of gender permanence.

The present study addressed the various problems described previously by taking a systematic look at the development of different components of constancy and their relations to diverse aspects of gender-typed beliefs. As described earlier, gender-related beliefs are acquired and become rigid during preschool but subsequently become more flexible, and Kohlberg's (1966) theory suggests that constancy understanding may account for these age differences. One strength of this study is that, to our knowledge, it is the first to examine this hypothesis directly by examining whether other aspects of constancy understanding (e.g., stability) mediate age differences in beliefs. Figure 1 shows a schematic representation of our mediational approach for two stages of constancy. Figure 1a is consistent with Kohlberg's ideas regarding the motivational importance of gender identity; however, it represents the prediction that stability, rather than consistency, mediates the increase in gender beliefs during preschool (Ruble et al., 2006). Figures 1b and 1c show two alternative predictions regarding the influence of consistency after age 5. Specifically, Figure 1b tests the idea that higher levels of consistency should lead to increases in rigidity whereas Figure 1c tests Huston's (1983) prediction that higher levels of consistency should lead to decreases in rigidity. The positive path from consistency to rigidity in Figure 1b represents the typical prediction and analysis in constancy research, that is, whether higher levels of consistency

are associated with greater rigidity at a single age or at multiple ages. In contrast to that approach, we are examining constancy as a mediator between age and level of rigidity.

The present study also examined whether different levels of gender constancy understanding might be related to different kinds of beliefs. To this end, multiple measures of stability, consistency, and gender-related beliefs were included. Children as young as 3 years of age were interviewed to provide us with the opportunity to capture the processes that occur at an early stage of gender constancy. Moreover, children representing a full span of 4 years, from early 3-year-olds to early 7-year-olds, were included in the sample so that possible curvilinear patterns of gender-related beliefs, posited earlier, could be examined. This age range was of particular interest because it has been identified as a period of rapid change in gender beliefs.

The gender-belief measures used in this study examined knowledge of gender stereotypes and several types of attitudes about norm adherence, specifically, the degree of belief that violations are wrong, feelings about interacting with norm violators, degree of fear of turning into the other sex if one violates gender norms, and expectations about parents' and peers' attitudes toward norm violations. In addition, based on the recent convergence of categorization theories discussed earlier, an additional type of belief was examined. Many studies have documented how identification with a particular social category can promote a sense of belonging, connectedness, and increased positive evaluation of the group (see Crocker, Major, & Steele, 1998). Accordingly, we included a measure of children's identification with their gender group, which included two types of items: centrality (the extent to which one's group is a salient and pivotal factor in the self-concept) and evaluation (individuals' affective reactions to their group identity). Taken together, these beliefs were used to examine the relations among: (a) age, (b) the understanding of the categorical constancy of gender, and (c) the motivation to learn about and be attentive to gender norms, as well as the sense of connection to and positive evaluation of one's gender group.

It was expected that children would show age-related increases in knowledge of gender stereotypes and gender category identification (centrality and evaluation), as well as increasingly rigid attitudes about adhering to gender norms, at least until 5 years of age. It was further expected that increasing understanding of some aspects of gender constancy would mediate these beliefs (see Figure 1). Whether that mediator would be gender consistency, as implied by Kohlberg (1966), or a lower level of understanding,

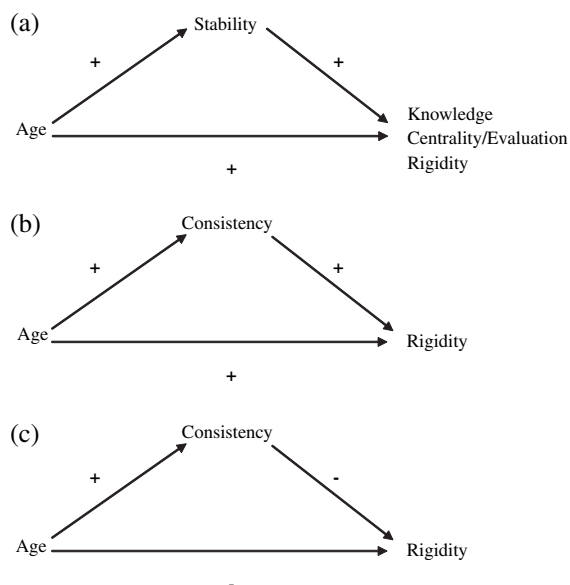


Figure 1. Predicted relationships among age, gender constancy, and outcome variables. Figure 1a represents predictions for stability and Figures 1b and 1c represent alternative predictions for consistency.

gender stability, as suggested earlier (Ruble et al., 2006), was also examined and is illustrated by comparing Figures 1a (stability) and 1b (consistency). Predictions for age-related changes after age 5 were less clear, however. Variables measuring the rigidity of beliefs were expected to show age-related declines, but whether constancy understanding would influence this decline was an open question. Answering this question was important because of the theoretical controversy discussed earlier about the association between higher levels of constancy and rigidity versus flexibility of beliefs. Figures 1b and 1c illustrate the alternative predictions derived from differing interpretations of Kohlberg's theory.

Method

Participants

Participants were recruited from public and private schools in a large eastern city, as well as through university faculty and staff willing to have their children participate. More than 90% of the children were White, with a small number of Asian, Latino, and African American children participating as well. Based on the demographic characteristics of the schools from which most of the children in this study were recruited, the majority of children were from middle- to upper-middle-class backgrounds. Ninety-four children ranging in age from 3.13 to 7.30 years ($M = 5.14$) were interviewed (48 girls, 46 boys). For most of the analyses, children were split into a younger (22 boys, 20 girls; $M = 4.08$) and older (24 boys, 28 girls; $M = 6.00$) cohort.

Procedures

Children were interviewed in two sessions at the university or in their schools, depending on the arrangements of the individual teachers and parents. Questionnaires were administered to participants in a set order designed to minimize possible effects of reactivity across measures. Interviewers—five female and one male—were all trained in the standardized administration of all measures (see Table 1). Preliminary analyses indicated no significant differences in the data collected by the various interviewers. Sessions typically lasted from 35 to 55 min. At the end of each session, children were given a small gift to thank them for their help.

Gender-Constancy Measures

An interview derived from previously validated measures was the primary way we assessed level of gender constancy attainment (Slaby & Frey, 1975; Szkrybalo & Ruble, 1999). Three levels of constancy were measured: identity (e.g., "Are you a boy or a girl?"), stability (transformations across time), and consistency (transformations across appearance or activity). Because the vast majority of the children (99%) in our study answered at least five of six identity questions correctly, the identity stage was not examined further.

Stability. Children's attainment of the stability stage was evaluated using two methods. The first part of the measure consisted of seven forced-choice questions based on prior gender constancy measures, as described previously. Of the seven forced-choice questions, three referred to the participant (e.g., "When you grow up, will you be a man or a woman?") and four referred to a male or female target (e.g.,

Table 1
Description of Dependent Variables by Cohort

Variable ^a	Alphas	Cohort 1 (3–4 years)			Cohort 2 (5–7 years)		
		Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>
Stability	.74	7–14	12.21	2.25	12–14	13.87	0.44
Consistency	.85	0–9.0	3.21	2.74	0–11	5.60	2.56
Gender knowledge	.53	0.4–1.0	0.89	0.19	0.6–1.0	0.96	0.10
Centrality/evaluation	.81	0–1.0	0.79	0.21	0–1.0	0.79	0.18
Rule-based rigidity	.73	0–1.0	0.55	0.24	0–1.0	0.42	0.33
Self rigidity	.89	0–1.0	0.71	0.34	0–1.0	0.60	0.37
Fear of changing sex	.61/.59 ^b	0–1.0	0.53	0.44	0–1.0	0.33	0.39
Peer rigidity	.60/.82 ^b	0–1.0	0.41	0.37	0–1.0	0.30	0.34
Parent rigidity	.74/.73 ^b	0–1.0	0.27	0.33	0–1.0	0.07	0.20

^aValues for the first two variables represent raw scores. Values for the remaining variables correspond to proportions.

^bBoy/girl.

"When this grown-up was little, was this grown-up really a girl or really a boy?"). The second part of this measure was based on a procedure originally developed by Hirschfeld (1996). Children were presented with seven sets of line drawings that varied on three dimensions: generation (child or adult), sex (male or female), and the presence or absence of a salient additional feature (such as freckles or a scar). The child was asked to match a target drawing with one of two choices, with the question, "What did the grown-up look like as a child?" or "What will this child look like as a grown-up?" The two pictures between which the participant was asked to choose differed in sex, thereby allowing the child to demonstrate his or her understanding of the continuity of gender by indicating, for example, that the boy target "goes with" the picture of a man. However, a conflict was embedded in these drawings, as the same-sex figure was always missing the feature present in the target drawing (such as freckles) and the other-sex figure always displayed the given feature. Stability was indicated by the child correctly recognizing the continuity of gender across time (e.g., choosing an unfreckled boy, rather than a freckled girl, to match a man with freckles). Because the Hirschfeld scale correlated with the standard measure of stability ($r = .30, p < .01$), the two stability subscales were combined into a single scale ($\alpha = .74$) to create a broad measure of stability. The scores thus could range from 0 to 14 (7 interview items, 7 Hirschfeld items; $M = 13.13, SD = 1.74$).

Consistency. Five forced-choice questions based on standard gender-constancy scales, as described previously, were asked to measure children's attainment of the consistency stage of gender constancy. Of the five forced-choice questions, two focused on whether participants believed they could change by wearing opposite-sex typed clothing (e.g., "If you went into the other room and put on clothes like these [show opposite-sex clothes], would you then really be a girl or really be a boy?") and engaging in an opposite-sex typed activity (e.g., "When you grow up, if you do the work that [opposite-sex adults] do, would you then really be a man or really be a woman?"). The remaining three questions asked participants to decide whether the sex of male and female targets could change if they wore opposite-sex typed clothing (e.g., "If this child [show photo of male child] put on clothes [show girls' clothes] like these, would the child really be a boy or really be a girl?") and engaged in an opposite-sex typed activity (e.g., "If this grown-up [show photo of adult male] did the work that women usually do, would this grownup really be a man or really be a woman?"). To rectify the potential problem of pseudoconstancy in the present study, forced-choice

consistency items were followed by open-ended probes that required children to explain the reasoning behind their forced-choice responses. Preliminary analyses suggested that responses to the forced-choice questions in our study were indeed misleading. Similar to the pattern found in the literature, forced-choice responses showed a dip in constancy attainment between ages 4 and 6, with 3-year-old children showing the highest attainment of consistency overall.

Children's responses to the open-ended consistency probes were recorded verbatim. Correct responses were then scored according to the coding scheme developed by Szkrybalo and Ruble (1999), which indicate preconstancy (e.g., "He still has a boy's face") or true constancy (e.g., "It doesn't matter what he's wearing. He'll always be a boy"). The coding of open-ended rationales was completed by two judges who were blind to the age of the child, and interjudge reliability was high (average kappa = .96 for five questions collapsed, omitting the "no response/unscorable" code). Items were scored as correct only if the initial forced-choice question was answered correctly and the open-ended response was scored as indicating true constancy.

In addition to these five items, a supplementary set of six forced-choice consistency questions was administered to all children. These questions were worded differently from those included in the standard interview measure, focusing explicitly on the act of transformation. Specifically, these questions focused on transformations involving the following: others' and personal appearance (e.g., "If a boy wore nail polish, would he become a girl?"), and others' and personal activity choice (e.g., "If you played with baby dolls right now, would you be a boy or girl?"). To score these items, 1 point was awarded for each correct answer. Preliminary analyses indicated that this subscale did not demonstrate the problematic relationship with age found with the standard forced-choice interview method scale, suggesting that an explicit emphasis on gender transformation is another way to avoid the effects of pseudoconstancy. In addition, this scale correlated significantly with the standard interview scale when the open-ended responses were taken into account ($r = .35, p < .01$). Therefore, the 11 total questions were combined into a single scale with a possible range of scores from 0 to 11 ($\alpha = .85, M = 4.53, SD = 2.88$).

Belief Variables

Children were asked a series of questions assessing their knowledge and feelings about gender, as well as how important it was that they and others adhere to

gender norms. Several of these were part of a series of related questions based on the prior literature (e.g., Levy et al., 1995; Smetana, 1986) about four highly gender-typed target behaviors: wearing nail polish, shaving one's head, playing with baby dolls, and playing with trucks. These items have been shown in prior studies to be among those that are gender stereotyped by young children (Lobel & Menashri, 1993; Smetana, 1986), and we selected this specific set to represent a range of different kinds of norm violations, in this case two types of cross-gender behavior: (a) physical or appearance and (b) activities. Four of the measures described next include questions from this series, as illustrated by the following set for nail polish:

Knowledge: Who usually wears nail polish, boys or girls?

Rule-based rigidity: Is it wrong for boys to wear nail polish?; Would it be OK for a boy to wear nail polish if he didn't get into trouble and nobody laughed?

Self-rigidity: Would you like to be friends with a boy who wears nail polish?; Would you like to go to a school where boys were allowed to wear nail polish?

Fear of changing sex: [lead-in question: Do you wear nail polish?] Are you afraid you would become a girl if you wore nail polish? (for boys only)

Knowledge. Children were asked which sex usually participates in each of five highly gender-typed behaviors: wears barrettes, wears nail polish, is strong, plays with dolls, and plays with trucks. Although more items about stereotyped knowledge were originally included in the interview, some had to be dropped because virtually all the children already knew them (e.g., shaves head) or they were not stereotyped as male or female typical (e.g., cooks). Responses to the five items were scored as number correct and converted to proportions. This was done to compare results across dependent variables, which were all transformed to a 0 to 1 scale. Thus, knowledge had a possible range of 0 to 1, indicating the proportion of the five items correct ($\alpha = .53$).

Centrality/evaluation. A measure of identification with one's gender group was developed based on prior research with adults (e.g., Luhtanen & Crocker, 1992) but using a format pioneered by Harter and Pike (1984) for interviewing preschoolers. Ten items were administered, assessing children's perceptions of how central gender was for them (e.g., feel that being

a boy is a big part of who they are; don't feel that being a girl means a lot to them) and personal evaluation of gender (e.g., feel that boys are great; feel proud to be a girl). For this measure, children were first read a sentence describing behaviors or beliefs of other children of their own sex (e.g., "Some girls feel that being a girl is important to them, but other girls do not feel that being a girl is important to them"). As each part of the sentence was read, the children were presented with a colorful strip of gender-neutral paper dolls to represent the subset of target children described. When both sets of dolls were placed on the table, the children were asked, "Which (girls/boys) are more like you?" and asked to point to the corresponding strip of paper dolls. After they responded, the children were asked, "Is that really true for you, or just sort of true for you?" This method resulted in a 4-point scale for each question. Scores across the 10 questions were then averaged and transformed to a range of 0 to 1 ($\alpha = .81$).

Rule-based rigidity. This scale, adapted from prior research (e.g., Smetana, 1986), measured children's perceptions about the elasticity of gender norms. Children were asked two forced-choice questions about each of four target behaviors described earlier (e.g., boys wearing nail polish): Is it "wrong" for boys or girls to participate in the cross-sex-stereotyped behavior? Would it be OK for boys or girls to participate in the behavior if he or she "did not get into trouble and nobody laughed"? Each response indicating a rigid approach to gender norms was given 1 point, and each response indicating a flexible approach was given 0 points. The eight scores for each child were then averaged and transformed to a scale of 0 to 1 ($\alpha = .73$, $M = .48$, $SD = .30$).

Self-rigidity. Children's attitudes about others who participate in or condone gender-atypical behavior were measured by their responses to eight questions. Two questions were asked in reference to the four target behaviors described earlier: Would the child want to be friends with someone who performed the particular cross-sex transgression? Would the child want to go to a school where the particular cross-sex transgression was allowed? Each response indicating a rigid approach to gender norms was given 1 point, and each response indicating a flexible approach was given 0 points. Scores across all questions were then averaged and transformed to a scale ranging from 0 to 1 ($\alpha = .89$, $M = .65$, $SD = .36$).

Fear of changing sex. Fear of physical repercussions for cross-sex transgressions was assessed with two forced-choice questions regarding children's fear of turning into the other sex if they were to engage in a sex-atypical behavior. Children were asked one

question for each of two other-sex stimuli (wearing nail polish and playing with baby dolls for boys; shaving one's head and playing with trucks for girls). The total score for each child was an average of the scores for their two responses, transformed to a scale from 0 to 1 ($M = .42$, $SD = .42$). As boys and girls were asked about different sets of stimuli, separate alphas were calculated (boys: $\alpha = .61$; girls: $\alpha = .59$).

Peer and parent rigidity. These measures were based on prior research on children's fear of being sanctioned for norm violations (e.g., Lobel & Menashri, 1993), with modifications based on pilot testing to ensure that items were perceived as cross-sex stereotyped. Lobel and Menashri (1993) used a truck and a doll to represent a same- and cross-sex-typed pair of toys, and they found high and equivalent stereotype knowledge about the two items when examining children the same age as those in the present study. We added a second pair that was very different in nature from Lobel and Menashri's stimuli to examine consistency in responding. A tea set and dinosaur were selected, based on pilot testing, as these were items with which children seemed familiar in terms of stereotypes and which we could present as actual toys.

Children were shown each pair of toys and asked what would happen if they chose one of the cross-gender toys placed in front of them and what their parents and friends might say in response. Two forced-choice questions were asked next, and they constitute the measures used in the present study: "Would your friends (parents) be angry? Would they make fun of you?" These questions were asked about two toys [dolls and tea sets for boys; trucks and dinosaurs for girls]. Thus, there were four scores for each participant, which were averaged, resulting in a score from 0 to 1 that represented the overall percentage of rigid responses, with a higher score indicating higher rigidity (peer measure: $M = .35$, $SD = .35$; parent measure: $M = .15$, $SD = .28$). Alphas for girls were: peers = .82 and parents = .73. Alphas for boys were: peers = .60 and parents = .74.

Results

The major purpose of this study was to examine age-related changes in gender-related beliefs and their relations to the stages of gender constancy in children. First, we investigated how each variable related to age, both graphically and in zero-order correlations. Next, we focused on mediation and moderation analyses of the effects of constancy on gender beliefs using regression analyses.

Introduction to Analyses

To examine the relation of gender beliefs to age, we first created smoothed plots using the Loess method of moving averages, which explicitly allows nonlinear patterns to be examined in the data. The Loess method (Cleveland, 1979) provides averages of data points associated with a window of ages, using a robust estimate that gives less weight to outlying points. Loess patterns were computed using SPSS Version 12 for gender constancy and beliefs against age. When these plots suggested that relations were uniform or linear across the whole age range, preliminary correlations and further analyses were performed on the entire sample. However, a preliminary examination of our plots revealed that many variables showed a curvilinear trend across age, with a change often occurring at approximately age 5. This curvilinear pattern was present in both constancy (e.g., stability and consistency) and outcome (e.g., centrality/evaluation and self-rigidity) variables (see Figures 2 and 3).

To examine the effects of such variables more accurately, we took the general approach of splitting the sample into younger and older children before proceeding with regressions. Even though the overall pattern was nonlinear over the full age span, it was locally linear in the two age cohorts. Therefore the data were split into two age groups, with 45% of the children falling into the age range of 3.13 to 4.99 years (Cohort 1) and 55% of the children falling into the age range of 5.00 to 7.30 years (Cohort 2). Thus, each variable was examined either across cohort or within cohort, depending on the shape of its plot. Table 1 presents the means, actual range in this sample, and standard deviations of all variables as a function of cohort.

Regression analyses were performed examining the associations among aspects of gender constancy, age, sex, and gender-related beliefs. It was expected that gender constancy would mediate the effect of age on beliefs: That is, age was expected to affect aspects of gender constancy (i.e., stability and consistency), which in turn were expected to affect gender beliefs (see Figure 1).

Testing the preceding hypothesis involved estimating one simultaneous and one hierarchical regression model for each outcome (see Baron & Kenny, 1986; Shrout & Bolger, 2002). Two sets of models were estimated: one with gender stability as mediator, the other with gender consistency as mediator. The effect of sex as a moderator of the relationships among constancy, age, and outcome was examined by including sex in the first step of the hierarchical regression analyses and sex interactions with age

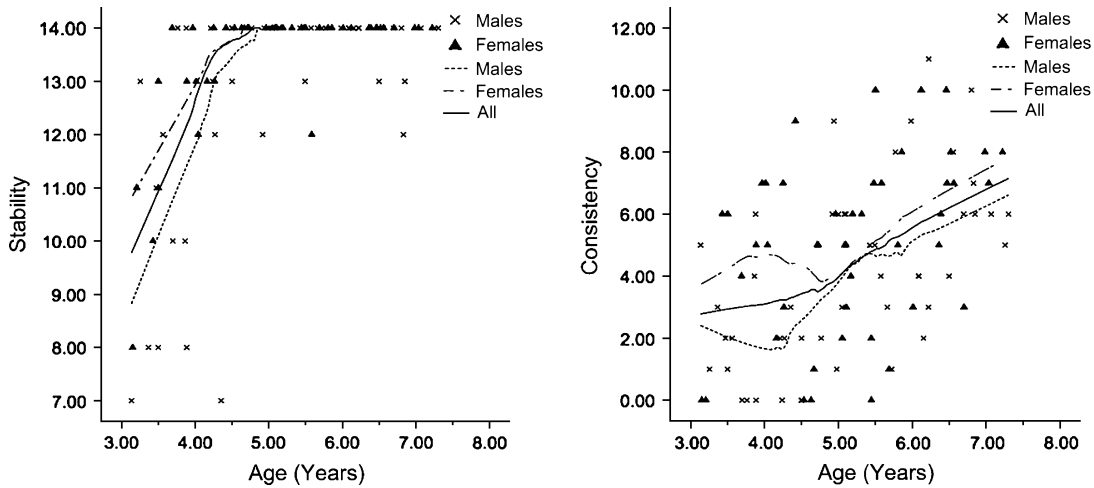


Figure 2. Sample Loess smoothed plots (full sample and within sex) of constancy variables across age.

and constancy in the latter steps of the analyses. Moderation effects of constancy were also tested via interaction.

In the first regression model for each combination of variables, we regressed constancy on sex and age. Next, in the first step of the hierarchical model, we regressed the outcome variable on sex and age to estimate the total age effect (adjusted for sex). According to Baron and Kenny (1986), the mediation analysis is meaningful if the causal order of the model can be justified and if the mediator variable is measured reliably. We note that the measures of constancy must follow from age, and not cause age change, and that outcomes such as gender beliefs are not plausible causes of constancy. We also note that we have evidence that the measures of constancy are measured reliably and that any genuine contamination of

either the mediator or the outcome would make it less (rather than more) likely that the mediation hypothesis would hold.

Following the Baron and Kenny (1986) approach, the regression coefficients for age in each of these first two models should be significant if the mediation hypothesis is viable. In the second step of the hierarchical analysis, we added constancy to the model. For mediation to be supported, two conditions were required: First, the indicator of constancy must be related to the outcome beyond the effect of age. Second, the effect of age must be attenuated after adjusting for that indicator of constancy. When the regression coefficient for constancy was significant and that of age was not, constancy was said to mediate completely the effect of age on outcome. Partial mediation was suggested by a significant age

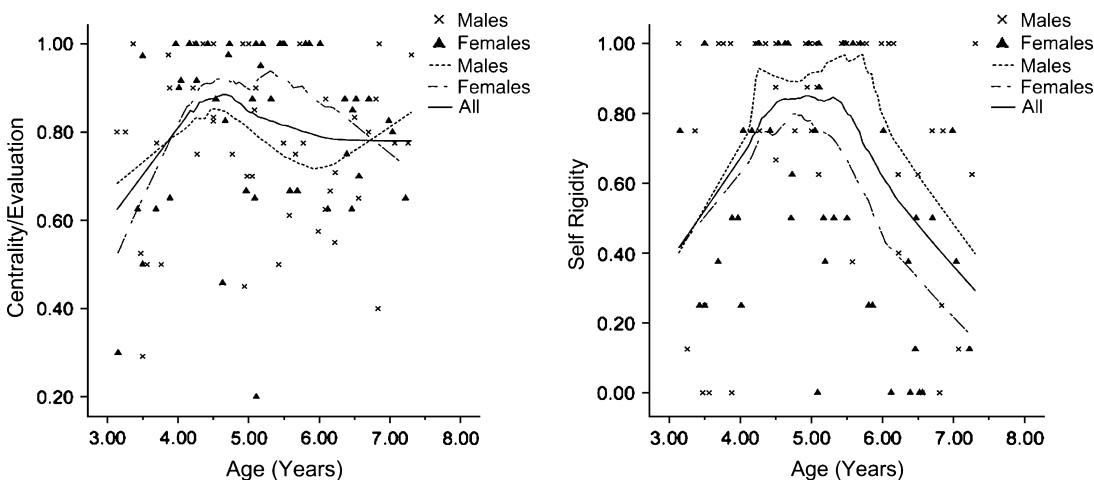


Figure 3. Sample Loess smoothed plots (full sample and within sex) of belief variables across age.

coefficient in the final model (the direct effect of age) that was smaller than the age coefficient in the first model (its total effect). The amount of the attenuation is described by the indirect effect of age on outcome via constancy. To confirm that partial mediation was present, we tested whether the indirect effect of age on outcome was significantly different from zero. As recommended by Shrout and Bolger (2002), we tested the indirect effect using bias-corrected bootstrap methods, as implemented in the structural equation package Amos 5 (Arbuckle & Wothke, 2003). If the indirect effect of age on outcome was found to be significantly different from zero, partial mediation was supported.

Although our primary goal was to examine the possible mediation effects of constancy, moderation effects and other relationships with constancy were noted as well. Regardless of the results of mediation analyses, we checked whether sex, age level, or both moderated the relationship between constancy and outcome. Moderation was tested using the two-way interactions (Sex × Age, Sex × Constancy, and Age × Constancy) and the three-way Sex × Age × Constancy interaction. In the event of a significant interaction, the simple effect of age, within sex or levels of constancy, was investigated. In the absence of any significant sex interactions, analyses were performed across sex.

For each outcome, regression analyses examining the consistency phase were performed either across cohort or within cohort depending on the shape of each smoothed plot. Stability analyses, on the other hand, were performed within Cohort 1 only, as

stability scores reached ceiling by age 5. Unstandardized regression coefficients are reported in all instances. In addition, the unstandardized partial regression coefficients for the noteworthy mediation analyses are reported in Table 2.

Gender Constancy

Scores for the various levels of gender-constancy understanding generally increased across age, as expected. There were some variations across cohort and sex, however. Examination of the Loess plot suggested that stability scores increased between 3 and 5 years ($r = .59, p < .001$) and then reached ceiling. After adjusting for sex in the simultaneous regression model, this increase with age remained, $b = 2.41, t(39) = 4.86, p < .001$.

The Loess plot of consistency suggested the expected increase across the full age span; results of the simultaneous regression, covarying sex, revealed this to be a significant effect, $b = 1.18, t(91) = 5.19, p < .001$. The Loess plot also suggested a curvilinear pattern. Within-cohort analyses indicated that there was a significant correlation between age and consistency for Cohort 2 only ($r = .34, p < .05$), which remained after covarying sex, via regression, $b = 1.30, t(49) = 2.59, p < .05$. In addition, there was a significant sex difference in consistency scores for Cohort 1 only, with girls ($M = 4.20$) scoring higher than boys ($M = 2.32$), $t(40) = -2.34, p < .05$.

In short, as expected from prior research, gender stability increased between 3 and 5 years of age (Cohort 1) and then reached ceiling. Gender

Table 2
Effects of Age on Outcome, Mediated by Gender Constancy

Sample	Knowledge		Centrality/ Evaluation			
	Cohort 1		Female cohort 1			
	Step 1	Step 2	Step 1	Step 2		
Age in years	0.17 (0.05)**	0.10 (0.06) [†]	0.18 (0.09) [†]	-0.05 (0.13)		
Stability		0.03 (0.02) [†]		0.09 (0.04)*		
Sample	Rule-based rigidity		Self-rigidity		Fear of changing sex	
	Full sample		Cohort 2		Full sample	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Age in years	-0.08 (0.03)**	-0.03 (0.03)	-0.23 (0.07)**	-0.15 (0.06)*	-0.07 (0.04) [†]	0.00 (0.04)
Consistency		-0.04 (0.01)***		-0.06 (0.02)**		-0.07 (0.02)***

Note. Unstandardized partial regression coefficients and standard errors (in parentheses).
[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

consistency scores were low for Cohort 1 children, increasing primarily between 5 and 7 years of age (Cohort 2; see Figure 2). The finding that Cohort 1 girls had higher consistency scores than boys is compatible with other research showing earlier awareness of gender in girls (Ruble et al., 2006).

Belief Variables

Knowledge. A Loess plot suggested that knowledge of sex stereotypes increased between ages 3 and 4 and then reached ceiling. Therefore, knowledge scores were further analyzed within Cohort 1 only. Knowledge increased significantly with age after adjusting for sex, $b = .17$, $t(39) = 3.55$, $p = .001$. Stability also proved to be a marginally significant predictor of knowledge in Cohort 1 after adjusting for sex and age, $b = .03$, $t(38) = 1.88$, $p = .067$. With stability and age in the model together, the impact of the direct effect of age on knowledge was reduced, $b = .10$, $t(38) = 1.74$, $p = .091$ (see Table 2). The 95% confidence interval (CI) around the indirect effect (age to stability to knowledge) did not include zero, indicating support for the mediation hypothesis (95% CI: 0.003, 0.169). In other words, the related increase in children's knowledge of gender stereotypes can be largely accounted for by the parallel age-related increase in their understanding that gender is stable across time.

Centrality/evaluation. Centrality/evaluation also increased between ages 3 and 4 and then reached ceiling; further analyses were conducted on Cohort 1 only. The relation between gender constancy and centrality/evaluation was more complicated than for knowledge because of a significant Stability \times Sex interaction, $b = .080$, $t(35) = 2.20$, $p < .05$. This led us to carry out the analyses separately for boys and girls. For girls, centrality/evaluation marginally increased with age, $b = .18$, $t(17) = 1.88$, $p = .08$, as did stability, $b = 2.39$, $t(18) = 5.26$, $p < .001$. When stability and age were in the model together, stability showed a positive relation to centrality/evaluation, $b = .09$, $t(16) = 2.26$, $p < .05$, whereas the direct effect of age on centrality/evaluation was reduced to nonsignificance, $b = -.05$, $t(16) = -0.36$, *ns* (see Table 2). A test of the indirect effect of age on centrality/evaluation, via stability, was marginally significant, providing some support for the mediation hypothesis (90% CI: 0.02, 0.50). This finding indicates that the age-related increase in Cohort 1 girls' positive identification with their sex can be largely explained by their increasing understanding of sex as an attribute that is stable across time.

For Cohort 1 boys, the relationship between age and centrality/evaluation was not significant, $b = .07$,

$t(19) = 0.84$, *ns*, precluding mediation. However, examination of models including interactions between age and the two gender-constancy variables revealed evidence of moderation via gender consistency: When age, consistency, and their interaction were simultaneously entered into the regression model for boys, the interaction term significantly predicted centrality/evaluation, $b = -.07$, $t(17) = -2.23$, $p < .05$, indicating moderation of the relationship between centrality/evaluation and age. Parameter estimates suggested that boys with high consistency showed high levels of centrality/evaluation at age 3, intercept $b = .89$, $t(17) = 6.38$, $p < .001$, but no further increase with age, slope $b = -.05$, $t(17) = -.55$, *ns*. Furthermore, boys with lower consistency had lower centrality/evaluation scores at 3 years, intercept $b = .43$, $t(17) = 2.70$, $p < .05$, but showed the greatest increase with age, slope $b = .29$, $t(17) = 2.31$, $p < .05$. In short, in Cohort 1, when boys' consistency was low, the older they were, the more positively they identified with their sex. When consistency was high, however, the initial level of centrality/evaluation was relatively high but did not vary with age. As shown in Figure 3, Cohort 1 boys' overall centrality/evaluation scores showed a curvilinear progression across age, first increasing and then decreasing. If this pattern reflects developmental changes connected to consistency understanding, boys in the high-consistency group might be expected to reach their peak earlier than boys in the low-consistency group. Estimates of intercept and slope at different levels of consistency provided support for this expectation.

Rule-based rigidity. According to the Loess plot, rule-based rigidity showed a decrease across the full age range. Thus, consistent with previous literature, older children were less rigid, less likely to believe that violating gender norms is "wrong." Regression analyses for this variable were examined across the full age range. As there were no interactions with sex, rule-based rigidity was examined across sex as well. Regression analyses indicated that rule-based rigidity significantly decreased with age, $b = -.08$, $t(90) = -3.14$, $p < .01$. However, recall that consistency increased with age. Moreover, consistency was inversely related to rule-based rigidity, $b = -.04$, $t(89) = -4.05$, $p < .001$, after adjusting for sex and age. When consistency and age were in the model together, the impact of age on rule-based rigidity was reduced to nonsignificance, $b = -.03$, $t(89) = -1.10$, *ns*. A test of the indirect path from age to rule-based rigidity, via consistency, was significant, supporting the mediation hypothesis: The confidence interval for this path did not include zero (95% CI: -0.08 , -0.03).

Thus, it appears that the age-related decrease in children's rigid adherence to gender-based rules was largely accounted for by their increasing understanding that gender remains constant.

Self-rigidity. As expected, there was an increase with age in self-rigidity scores for Cohort 1 but a decrease for Cohort 2 (see Figure 3). Thus, self-rigidity was examined separately within the two cohorts. In Cohort 1, the effect of age on self-rigidity scores, adjusting for sex, was positive and significant, $b = .29$, $t(37) = 3.26$, $p < .01$; recall the same was true for stability. It is interesting that there was essentially no zero-order correlation between stability and self-rigidity even though both were related to age ($r = .02$, *ns*). Furthermore, when stability and age were in the regression model together, stability was significantly negatively associated with self-rigidity, $b = -.07$, $t(36) = -2.41$, $p < .05$. This is a pattern that has been called suppression in the regression literature (e.g., Cohen, Cohen, West, & Aiken, 2003). When this pattern occurs, we conclude that the mediation hypothesis does not hold (see Shrout & Bolger, 2002). Thus, an increase in self-rigidity with age is not accounted for by increasing stability, despite parallel age trends in Cohort 1.

For Cohort 2, we could only examine relations with the consistency phase of constancy. Recall that, in contrast to self-rigidity, consistency showed a significant age-related increase. In addition, consistency significantly predicted self-rigidity in Cohort 2, $b = -.06$, $t(48) = -3.55$, $p < .01$, after adjusting for sex and age. When consistency and age were in the model together, the impact of age on self-rigidity was reduced, $b = -.23$, $t(49) = 3.45$, $p < .001$, but remained significant, $b = -.15$, $t(48) = -2.37$, $p < .05$, suggesting partial mediation. A test of the indirect effect of age on self-rigidity, via consistency, was significant, supporting the mediation hypothesis (95% CI: $-.17$, $-.03$). In other words, as with rule-based rigidity, the age-related decrease in Cohort 2 children's rigid reactions to the violations of gender norms by others was largely accounted for by their increasing understanding that gender remains constant, despite any superficial transformations that may occur.

Fear of change. Finally, fear of change scores showed a moderate but consistent decrease across the full age range. Thus, these analyses were performed across cohorts. The regressions indicated that consistency significantly predicted fear of change, after adjusting for age and sex, $b = -.07$, $t(85) = -3.89$, $p < .001$. When consistency and age were in the model together, what had been a marginally negative effect of age on fear of change, $b = -.07$, $t(86) = -1.83$, $p = .07$, was reduced to zero, $b = .00$, $t(85) = -0.07$, *ns*. The test of the indirect effect was significant

(95% CI: $-.12$, $-.03$). Thus, the age-related decrease in children's fear of transforming into the opposite sex can be largely explained by their increasing understanding that sex is a permanent attribute.

Peer rigidity. Consistent with previous research, boys were significantly more likely to feel that peers would react negatively to violations of gender norms (boys: $M = .44$; girls: $M = .25$), $t(89) = 2.53$, $p < .05$, especially among Cohort 2 children. However, in contrast to predictions, there were no significant relations with age, nor were there any with constancy.

Parent rigidity. Parent rigidity decreased sharply between ages 3 and 4, and then reached floor; thus, analyses were only conducted within Cohort 1. However, whereas parent rigidity decreased with age, $b = -.24$, $t(37) = -2.69$, $p < .05$, and stability increased, stability failed to show a significant relationship to parent rigidity in Cohort 1, $b = .02$, $t(36) = 0.49$, *ns*.

Summary. The regression results generally supported our expectations that constancy would mediate the relation between age and belief variables in either Cohort 1, Cohort 2, or both. As expected, early understanding of gender constancy, the stability phase, accounted for age-related increases in stereotype knowledge within Cohort 1 across sex and for increases in centrality/evaluation but for girls only. In addition, increased comprehension of the more advanced consistency stage mediated the decrease across age for three variables assessing rigidity of beliefs: rule-based rigidity (across the full age range), self-rigidity (Cohort 2 only), and fear of change (across the full age range).

In addition to these mediation effects, consistency served as a moderator of the relation between age and centrality/evaluation for boys in Cohort 1. The pattern of findings suggested that consistency may play a role in the curvilinear progression across age observed for boys on this variable, first increasing and then decreasing (see Figure 3). Taken together, these results suggest that the relations between age and most of the belief variables were affected by constancy in some way. However, although stability was related to increases in variables associated with understanding and identifying with gender (knowledge and centrality/evaluation), higher levels of consistency were generally associated with lower levels of variables assessing the rigidity of beliefs.

Discussion

Although many previous studies have supported Kohlberg's (1966) theory that gender constancy is associated with children's attention to and rigid adherence to gender norms, there have been many

inconsistent findings and gaps in the understanding of this process. These gaps have included a full understanding of pseudoconstancy and a thorough differentiation of the effects of different stages of gender constancy. The present study attempted to close these gaps by examining different levels of constancy understanding (stability and consistency) and their associations with different kinds of gender-related beliefs. We also built on the existing body of literature by interviewing children across an age range of 3 to 7 years, and adding to and modifying the standard measures of gender constancy. Finally, and perhaps most notably, this study was the first of its kind to use a mediational analysis to examine whether level of constancy understanding can account for age differences in gender-related beliefs.

Stages of Gender Constancy

Even among the researchers who agree with Kohlberg's (1966) assessment of the importance of gender constancy, controversy has remained as to which stage of constancy drives children's reactions. Kohlberg's theory implied that full constancy was the primary motivator, but more recently researchers have argued that changes in children's orientation toward gender may occur in relation to earlier stages. A major goal of this study was to compare the stability and consistency stages of gender constancy in the process of gender development.

As noted previously, the idea of pseudoconstancy has been proposed to help explain the studies that have failed to corroborate the link between constancy and childhood gender rigidity. Pseudoconstancy implies that many young children answer advanced forced-choice gender constancy questions accurately without truly understanding the meaning of gender permanence. As a result, scoring only forced-choice responses to gender consistency questions without addressing children's justifications may overestimate their level of constancy understanding. Therefore, to clarify the developmental trajectory of gender constancy understanding, we investigated participants' reasoning behind their responses on assessments of consistency.

We performed preliminary analyses examining forced-choice consistency questions only. Using this method, the consistency scale showed the same dubious pattern that has frequently appeared in the literature, with a dip in scores appearing at approximately age 4. We then analyzed the consistency scale again, this time including open-ended follow-up probes. As hypothesized, we found that the revised consistency scale did not demonstrate the problematic relationship with age that was evidenced by the

standard forced-choice scales. Instead, we found that the revised scales linearly increased with age consistent with expectations. This finding supports earlier suggestions that exploring children's reasoning behind their constancy responses (as well as including items that highlight the act of gender transformation) enables a more accurate and thorough depiction of the relationship between constancy and age (Emmerich et al., 1977; Wehren & De Lisi, 1983). This is important in interpreting inconsistencies across studies and differences between the present findings and past research. That is, because previous research has simply correlated gender-constancy scores with various outcomes, without regard to age, the exact nature of the relation is difficult to identify. For example, if, as in our study, higher forced-choice consistency scores were found with younger than with older children, a positive relation between constancy and rigidity would be misleading.

Relations Between Gender Constancy and Gender-Related Beliefs

Gender constancy was, as expected, associated with many of the gender development outcome variables. Supporting Huston's (1983) interpretation of Kohlberg's (1966) theory, however, higher levels of constancy were associated with lower levels of rigidity of beliefs for the most part. This trend was especially clear for the relations with consistency across cohort or among Cohort 2 children. Moreover, once children gained a firm grasp of stability, by approximately 5 years of age, sex-typed beliefs showed a decline in rigidity for many variables. Specifically, stability scores reached ceiling by 5 years of age, in parallel with several belief variables (knowledge, centrality/evaluation, and self-rigidity). After this point, these belief variables failed to show further increases with age and, in some cases, showed declines with age. In addition, consistency mediated significant or marginal declines with age for rule-based rigidity, self-rigidity, and fear of changing sex. Such findings provide support for one of the alternative interpretations of Kohlberg, described previously and depicted in Figure 1c. That is, children's understanding that sex does not change despite superficial transformations (e.g., clothing) enables greater flexibility rather than greater rigidity (Huston, 1983).

This pattern of findings is consistent with more general cognitive-developmental trends observed in the literature on children's "essentialistic" thought (Gelman, 2003). That is, although younger children (Cohort 1) can understand that there are some essential nonobservable features that differentiate males

and females, it is not until later (Cohort 2) that they consider such features to be more diagnostic of category membership than outward appearances and behaviors. In other words, one way to interpret children's rigid beliefs is as "misattributions" regarding the cause of gender-stereotyped behavior. If children think that playing with dolls results from "girlness," they would be distressed to see a boy playing with a doll. Once children recognize that most appearance and behavioral differences are less critical, they can be more flexible in their reactions to gender norm violations.

There were two important exceptions, however, to the conclusion that constancy is associated with decreases rather than increases in gender-related beliefs. First, for variables that reflect children's initial learning about and attachment to gender (termed the "construction" phase by Ruble, 1994, and "information gathering" by Welch-Ross & Schmidt, 1996), there were positive rather than negative relations. Specifically, higher levels of stability understanding were associated with greater knowledge of gender stereotypes and higher own-sex centrality and positive evaluation among 3- to 5-year-old children. Moreover, level of stability understanding mediated the increase of these variables across age, thereby supporting the prediction in Figure 1a, although for centrality/evaluation, this was true for girls only. These data thus provide support for Kohlberg's (1966) hypothesis that constancy spurs the organization of children's gender beliefs. As predicted, however, the present findings suggest that an early stage of constancy—children's beliefs that their gender remains stable over time—is associated with this process, not mature constancy—the understanding of consistency across superficial transformations. Moreover, in direct contrast to Kohlberg's predictions, the increase between 3 and 5 years in self-rigidity was not moderated by stability understanding.

The pattern found for centrality/evaluation is consistent with hypotheses derived from social category theories that children's growing understanding of gender category membership (in this case, marked by the attainment of the stability phase) is associated with an increase in the importance and positive assessment of their gender. Why this relation was stronger for girls is not clear and appears to be inconsistent with the typical findings of stronger gender-role pressures on boys than girls (e.g., Levy et al., 1995). One possible explanation for this apparent discrepancy is that centrality/evaluation is not a measure of adherence to norms but rather importance and positive evaluation of one's gender category. Previous researchers (e.g., Egan & Perry, 2001)

conceptualize contentedness with one's gender assignment and pressure to be gendered as different things that can be, but do not have to be, related. This research suggests that it is the interaction of these two processes that is likely to be important. For example, feeling pressure to be a boy and being unhappy about being a boy likely creates adjustment problems. In addition, for young children, it may be that gender is more salient for girls in that there are clear distinctions in physical appearance. That is, dresses, jewelry, and long hair are distinctly associated with displaying oneself as a girl; whereas boys do not have such overt symbolic representations of their gender, at least at this young age. Because salience is an important element in determining the effects of social category identification (Bigler, 1995), young boys may be less affected by it.

Second, there was some evidence that levels of constancy may moderate the effects of age on beliefs. Specifically, significant moderation via consistency was found, among boys only, for centrality/evaluation. The low-constant boys started with lower scores (i.e., low centrality/evaluation) and showed an increase with age, whereas the high-constant boys started higher and reached a plateau with age. Thus, the findings suggest that the curvilinear patterns in gender typing are a joint function of age and constancy understanding. Perhaps, then, the relatively high rigidity that was seen in the youngest children for variables such as parent rigidity or fear of changing sex may be construed as the peak of a curvilinear trend, associated with even earlier understandings of gender categories such as basic gender labeling and identity that start to emerge before 2 years (Zosuls, Ruble, Tamis-LeMonda, Haddad, & Greulich, 2006). Clearly, longitudinal analyses are required to evaluate this interpretation of these apparent curvilinear patterns.

In short, the present findings suggest, as expected, that stability and consistency may have different functions at different age levels. The earlier stage of gender constancy (stability) was associated with the process of gender "construction" in 3- to 5-year-old children (Ruble, 1994), as shown in Figure 1a, whereas consistency appeared to be more important when older children were included in the analyses and to be associated primarily with a relaxation of gender norms, as shown in Figure 1c. These relations have been proposed in the past (Martin et al., 2002; Ruble et al., 2006), but the present study is the first to provide direct support for the hypothesized differential effect of these two stages of gender constancy. Note that the pattern of results might be said to be consistent with a ceiling effect on stability for the older cohort. If the ceiling effect is thought to be

a description of mastery of the idea of gender stability (i.e., as a reality of development), then we agree. We do not believe that the lack of variability in gender stability among the older children is a measurement artifact, however. Once a stage is mastered, it makes sense that a measure of that stage would not have between-person variability.

It is noteworthy that none of the findings support Kohlberg's (1966) predictions regarding a relation between constancy and increases with age in gender rigidity. The failure to find a link between stability and the increase in self-rigidity between 3 and 5 years is particularly surprising. One possibility is that rigidity during this period reflects more general cognitive developmental processes. For example, because the children in this study were at ceiling levels for identity (Kohlberg's Stage 1), essentialistic thinking may have contributed to increasingly negative evaluations of norm violations (Levy et al., 1995), regardless of the further understanding of gender categories represented by gender stability. In addition, phase models of social category or social script learning (Ruble, 1994; Welch-Ross & Schmidt, 1996) imply that rigidity may be a natural outgrowth of gaining relevant social knowledge at any point in the lifespan, which passes once conclusions are well formed. This kind of rigidity may be exacerbated for gender categories because knowledge about them occurs early in development, at a time when children are exhibiting cognitive rigidity more generally, such as the lack of multiple classification skills (Bigler, 1995) or an inability to appreciate variation within social categories (Martin, 1993).

Inconsistent Findings and Limitations

Although the results taken together follow the general pattern described previously, some of the individual analyses were less conclusive. Most notably, two of the belief variables showed no relation to constancy: parent rigidity and peer rigidity. These were intended to capture children's concerns about how others will respond to their own gender transgressions. Both variables showed unexpected age-related patterns, however. Parent rigidity showed a sharp drop in perceived sanctions between 3 and 4 years, whereas peer rigidity failed to show a significant age pattern, but only a sex difference in Cohort 2. The sex difference showed more concern by boys about violating norms and is thus consistent with prior research that suggests that gender norm violations seem to represent greater transgressions for boys than for girls (e.g., Levy et al., 1995). It is also possible that the items for boys

represented more of a violation for boys than for girls, and it would be interesting in future research to try to ensure equivalence of perceived violations. Nevertheless, possible lack of equivalence of violations represented by the items seems unlikely to account for the anomalous age patterns or lack of relations with constancy.

Instead, the most likely reason for the discrepant patterns observed for these variables is that unlike previous studies or the other measures in the present study, these questions asked about personal transgressions (e.g., "What would happen if you wore nail polish"). In retrospect, it is not surprising that beliefs about one's own behaviors might be different from more general beliefs about gender norms and how they function. For example, young children may not want to contemplate the possibility that their parents would be angry with them, but they have no trouble indicating parental displeasure with somebody else's transgression (Lobel & Menashri, 1993). It would be informative in future research to ask similar questions about own and others' gender transgressions.

Several methodological issues should also be noted. First, our analyses indicated that boys and girls demonstrated different levels and age patterns for many of the variables, as did children in the two cohorts. As a result, trends were often best understood when analyses were done separately within cohort and within sex. However, this approach often significantly reduced the sample size for each analysis, resulting in diminished power.

Second, for a few variables, levels of internal consistency (Cronbach's alpha) were less than 0.70, and this might indicate that the measures were unduly influenced by measurement error. In particular, the alpha values for peer rigidity were .61 and .59 for boys and girls, respectively. Insofar as alpha is a measure of reliability, these low values are expected to reduce the strength of association with other variables. From this perspective, we cannot be sure that the lack of associations between peer rigidity and the variables of age, stability, and consistency was not due to imprecise measurement of peer rigidity. For other variables, however, the lower alphas do not seem to be as much of a problem. Measures of knowledge and fear of changing sex had alphas less than 0.70 but were related to other variables in meaningful ways. Knowledge was not only related to age in the younger cohort but it was also marginally related to stability in that same cohort, and that relation helped explain the age-knowledge association. Our measure of fear of changing sex had meaningful associations with age and consistency. These relations suggest that these variables contain sufficient signal to noise. It is

possible that the low alpha values for these variables reflect instances where internal consistency provides a biased (too small) estimate of true reliability (Lord & Novick, 1968, p. 211). In the future it would be ideal to obtain test–retest estimates of the reliability of these variables as well as estimates based on internal consistency. It would also be useful to evaluate reliability separately in younger and older children, an analysis not possible with our limited sample.

Third, relatively few children had reached full constancy (i.e., attainment of the consistency stage). Consequently, although the present findings suggested that higher levels of consistency understanding were associated with greater flexibility, rather than rigidity, we cannot rule out the possibility of a relation between full constancy understanding and increased rigidity in older children. Indeed, some previous researchers have reported that the relative rigidity and flexibility of gender-related beliefs wax and wane throughout childhood (e.g., Stoddart & Turiel, 1985). It would thus be useful in future research to examine whether even more mature levels of constancy understanding after age 7 are associated with such curvilinear patterns in gender beliefs among older children.

Conclusion

The results of this study provide reasonably compelling evidence to support Kohlberg's (1966) claims regarding the gender organizing and construction effects of gender constancy. There was also supportive evidence concerning a link to beliefs about adhering to gender norms, though for the most part this relation was in the direction of greater flexibility rather than rigidity. Moreover, in accordance with developmental phase models, the nature of the relations observed depended in part on the stage of constancy attained. The initial understanding that gender is stable over time was associated with motivations relevant to constructing an identity, such as children's perceptions of and interest in their own group, whereas an understanding of the consistency of gender across superficial transformations was associated with a decline in the rigidity of beliefs. Future research should continue to investigate these trends with a larger sample size, the inclusion of older children, and longitudinal analyses.

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