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Gender and Psychological Essentialism

Gail D. Heyman* and Jessica W. Giles**

* University of California, San Diego

** Vanderbilt University

SUMMARY

When individuals reason in an essentialist way about social categories, they assume that group differences reflect inherently different natures (Gelman, 2003; Rothbart & Taylor, 1992). This paper describes the psychological and social implications of essentialist beliefs, and examines the extent to which children exhibit psychological essentialism when reasoning about gender. The authors discuss reasons young children as well as older children show essentialist reasoning in some contexts, but not in others. Finally, the authors suggest directions for future research, and discuss a primary challenge to many working in this field: reduction of rigid gender beliefs.

Keywords

gender; essentialism; belief

In a widely-reported address to an economic conference (Summers, 2005), Harvard University President Lawrence Summers raised the possibility that innate differences between the genders are a significant contributor to women's under-representation in science and engineering at top universities. Supporters argued that Summers was only suggesting that innate differences be considered as one among many potentially important factors, and maintained that even if such arguments seem threatening or unpleasant, they must be subjected to critical evaluation if science is to move forward (e.g., Psychoanalysis Q-and-A: Pinker, 2005). From this perspective, one might be surprised at the extent of the public outcry that Summers' arguments set off, an outcry resulting in, among other things, a vote of no confidence by the faculty of Harvard College.

There are several reasons to take the critics' concerns seriously. One central issue has to do with the possibility that such statements have the potential to become self-fulfilling prophecies (see Rosenthal, 2002; see also Ceci & Bruck, 1995, regarding the role that authority figures might play in guiding expectancy confirmation). Indeed, there is a wealth of evidence that people's beliefs play a powerful role in shaping reality for themselves and for others (Ambady, Shih, Kim, & Pittinsky, 2001; Dweck, 1999; Eccles, 1994; Rosenthal & Jacobson, 1968; Steele, 1997; Steele & Aronson, 1995). For example, in a landmark study, Rosenthal and Jacobson (1968) demonstrated that teachers' expectations for achievement can influence their students' actual level of achievement. In that study, elementary school children were given a test, and their teachers were told that the results of the test would identify a group of students who were about to undergo a period of intellectual blooming. Teachers were then given a list of children who were about to "bloom." Although children's names had been selected at random for inclusion on the list, over the course of the school year, the students on the list showed stronger academic gains than their peers. Since that study was reported, numerous expectancy effects have been documented by many researchers in a variety of different contexts (see Rosenthal, 2002, for a review).

Related to these expectancy effects, there have been well-documented stereotype threat effects in which individuals underperform following the activation of negative stereotypes about their gender or ethnicity (Ambady, Shih, Kim, & Pittinsky, 2001; Steele & Aronson, 1995). Such effects can occur even when individuals reject the stereotypes in question; one need only be aware that he or she may be judged by others with reference to the stereotype (Steele, 1997).

Another reason to take the critics of Summers' speech seriously is that his arguments can be viewed from as part of a broader class of arguments that have been made for hundreds of years in attempt to explain gender differences. In "The Mismeasure of Man," Gould (1981) noted that leading psychologists in the late 19th and early 20th centuries put forth many essentialist arguments to promote negative views of women. Two examples are below:

- In 1879, Gustave Le Bon argued that "there are a large number of women whose brains are closer in size to gorillas than to the most developed male brains", that "they represent inferior forms of human evolution" and that "they excel in fickleness, inconstancy, absence of thought and logic, and incapacity to reason." He concluded that it would be dangerous to provide the same education to girls as boys (Le Bon, 1879; 60–62; described in Gould, 1981, p. 104–105).
- In 1905, Stanley Hall argued that there are "profound psychic differences" between men and women and that "woman's body and soul is phyletically older and more primitive, while man is more modern, variable, and less conservative" (Hall, 1904, vol. 2, p. 194; described in Gould, 1981, p. 118).

These and other essentialist arguments vary a great deal in form. There is variation in the nature of the essence they point to, or even in whether any sort of essence is specified at all (Medin & Ortony, 1989). There is also variation in the extent to which they hold negative versus positive implications for the groups that are characterized (Bohan, 1993). For example, although many essentialist arguments have been used to point out women's deficiencies, others have been used to promote the view that women have positive characteristics, such as a tendency to be peace-oriented or relationship-oriented, that are underappreciated yet fundamental to womanhood (Gilligan, 1982; see Oyama, 1997). Despite these differences, what essentialist arguments about gender share is the basic premise that gender differences reflect differences in underlying nonobvious essences (Gelman, 2003). A substantial body of research suggests that when individuals engage in this type of essentialist reasoning, it is likely to have important psychological and social implications. These implications are described in the following section.

Implications of Essentialist Beliefs

Social scientists have long theorized about the dangers of essentialist reasoning. One major criticism of essentialist explanations for group differences is that they can be used to justify or naturalize inequities in social power between groups (Brewis, 2001; Gould, 1981; Landrine, 1998; Mahalingam & Rodriguez, 2003). For example, if a high-status individual feels that his or her privilege results from natural ability, he or she may take this as evidence that the status quo is just, and that consideration of social inequity need not be taken seriously.

A related concern is that essentialist reasoning can effectively limit human potential. Gould (1981, p. 28) argued that biological determinism, a form of essentialist reasoning, is "a theory of limits" that "takes the current status of groups as a measure of where they should and must be." Moreover, essentialist reasoning can influence the range of choices people consider for themselves. For example, when individuals think that gender roles reflect natural tendencies, they are unlikely to consider possibilities outside these roles; such

effortful examination of possibilities is a critical component of identity formation (Marcia, 1966), in large part because it plays an important role in education- and occupation-relevant decisions (Eccles, 1994).

Others have raised the concern that essentialism is associated with faulty patterns of reasoning (Bohan, 1993; Tavris, 1999). For example, Tavris (1999) argued that essentialist reasoning is associated with the tendency to conflate sex with social circumstance. Gjerde (2004) argued that essentialist arguments made by social psychologists promote a disregard for heterogeneity, agency, and individuality.

A number of researchers have examined the implications of essentialist beliefs by examining the reasoning processes of individuals who hold beliefs that are consistent versus inconsistent with psychological essentialism. Such examinations have pointed to the general conclusion that essentialist beliefs about people do indeed have numerous negative implications, including increased punitiveness, motivational helplessness, and a tendency to pigeonhole people into evaluative categories.

One common finding is that people who reason in essentialist ways often appear to be judgmental and punitive than others. Giles (2005) found that essentialist beliefs about crime are associated with a tendency to support punitive legal sanctions, and to view criminal rehabilitation as ineffective. Consistent with these findings, in research specifically related to gender, Haslam and Levy (in press) found that the belief that lesbianism is a universal and reified category predicts anti-gay attitudes. The link between essentialist reasoning and increased punitiveness has also been found among children: Graham and Hoehn (1995) found that children who viewed aggression as internally driven and stable over time recommended more punishment for transgressions than did other children (see Giles & Heyman, 2003, for related findings).

Essentialist beliefs have also been tied to responses characteristic of motivational helplessness (Giles & Heyman, 2003; Heyman, Dweck, & Cain, 1992; Heyman & Dweck, 1998). In the academic domain, the belief that intelligence is fixed has been linked to relative deficits in academic achievement (Stipek & Gralinski, 1996), and with a tendency to show negative affect, negative self-cognitions, low expectations, and motivational debilitation in the face of obstacles (Cain & Dweck, 1995; see Dweck, 1999). In the social domain, the belief that personality is fixed or that trait-relevant behavior is stable is associated with a helpless pattern of response that includes negative self-attributions and diminished social persistence (Erdley, Cain, Loomis, Dumas-Hines, & Dweck, 1997; Giles & Heyman, 2003; Heyman & Dweck, 1998). For example, Heyman and Dweck (1998) found that 7- and 8-year-olds who endorsed a belief in the long-term stability of sociomoral traits (specifically, agreeing that a child who exhibits negative behavior will continue to do so over a long period of time) showed a tendency to equate academic difficulty with inability, and to deemphasize the importance of task-relevant effort and strategizing. Giles and Heyman (2003) found that preschoolers who agreed that traits are stable were less likely to focus on the role of psychological processes in social situations, and more likely to approve of the use of aggression in the context of interpersonal disputes.

Essentialist beliefs have also been tied to an increased tendency to make quick judgments of other people (Chiu, Hong, & Dweck, 1997; Erdley & Dweck, 1993; Levy & Dweck, 1999). Among late elementary school age children, the belief that one cannot change one's traits in a fundamental way is associated with a tendency to make global negative judgments of others who commit even minor transgressions (Chiu, Hong, & Dweck, 1997; Erdley & Dweck, 1993) and with the tendency to form stereotypes (Levy & Dweck, 1999). In sum, there is substantial evidence that individuals who view traits as fixed or stable over time and

across situations show a greater concern with potentially unfavorable behaviors and outcomes, and are more inclined to make negative evaluations of the general characteristics of others.

These negative implications of essentialist beliefs highlight the importance of understanding the contexts in which such beliefs develop. In order to understand the development of essentialist beliefs about gender, we now turn to the question of whether young children tend to exhibit such reasoning. By looking at this age group, it is possible to gain insight into whether essentialist beliefs require extensive enculturation (see Gelman & Taylor, 2000).

Do Young Children Essentialize Gender?

Young children's tendency to display essentialist beliefs about gender appears to vary as a function of the aspects of essentialism that are being assessed, and the means of assessment.

There is evidence that young children often show essentialist reasoning about gender, but that they do not always do so. One component of essentialist reasoning that is often evident among young children is the tendency to view gender differences as innately driven. Taylor (1996) presented 4- to 10-year-olds and adults with a nature/nurture conflict that described a child who is raised from birth on an island inhabited only by members of the opposite sex. Stereotypically feminine (e.g., "wears dresses," and "wants to be a nurse") and stereotypically masculine (e.g., "gets into fights a lot," and "wants to be a firefighter") properties were described, and participants were asked which of these properties the child would express at age 10. Until age 9 or 10, participants reasoned that the properties would be determined primarily by nature. This finding is consistent with other evidence that young children tend to endorse the role of nature in determining gender-stereotyped properties, and that this tendency tends to decline across the elementary school years (Smith & Russell, 1984).

If young children hold nativist beliefs about gender, one might also expect them to be very resistant to the idea that gender can change. However, this tends not to be the case: before children reach school age, they generally expect changes in gender category membership (see Ruble & Martin, 1998). For example, extensive research suggests that before age 7, children commonly assume that a boy who wears a dress will become a girl. However, there are also a small number of studies suggesting that even preschool children sometimes display essentialist reasoning on questions relating to the possibility of gender transformation (Bales & Sera, 1995; Bem, 1989; Siegal & Robinson, 1987). For example, using a procedure that involved nude or seminude photographs of toddlers, Bem (1989) found that 40% of 3-, 4-, and 5-year-olds conserved sex across perceptual transformation, and that children's conservation was closely related to knowledge of genital differences between the sexes.

Another indicator of children's tendency to essentialize gender is the extent to which it is seen as having inductive potential (Gelman, 2003; see Rothbart & Taylor, 1992). Based on this indicator, children show essentialist tendencies in their reasoning at a very young age. By age 2, children use gender to guide their expectations about the kinds of behaviors others are likely to exhibit (Serbin, Poulin-Dubois, Eichstedt, 2002; Poulin-Dubois, Serbin, Eichstedt, Sen, & Beissel, 2002). Throughout childhood, gender continues to affect inferences about unfamiliar individuals, such as toy preferences (Berndt & Heller, 1986). Gender also appears to have strong sociomoral implications (Giles & Heyman, 2004, 2005; Heyman, 2001). Giles and Heyman (2004) found that even preschool children tended to evaluate the same ambiguous behaviors more harshly when the perpetrator was a boy as compared to a girl (see Heyman, 2001, for related findings among 7- to 9-year-olds). These findings suggest that even at a young age, children view gender as a conceptual tool for

interpretation and prediction in a wide range of situations that involve reasoning about people.

What is the Appeal of Essentialism?

Why might children and adults view gender in essentialist ways? One likely reason is that essentialist frameworks provide an intuitive way for children to think about the world using basic cognitive capacities that readily permit generalization across category members (Gelman, 2003; Gelman & Taylor, 2000). This is because in order to form and use categories, children must learn to group things based on key commonalities between entities, and ignore many differences between them. For example, they must learn that entities that differ greatly on a number of dimensions such as color and material can function as “hats.”

Essentialism may also be a consequence of children’s general desire to seek out and make sense of causes (see Schulz & Gopnik, 2004), a tendency Gelman (2003) has referred to as causal determinism. It may be that essentialist explanations are easy to generate when other explanations are not salient. For example, a child might conclude that a peer who acts in a certain way must have been born that way, because no alternative explanations are salient. Such a tendency is consistent with Gelman’s (2003) notion that, in the absence of other information about causes, young children are driven by an “innards principle.” Some might argue that such an “explanation” is not much of an explanation at all. Indeed, many essentialist explanations provide little in the way of concrete mechanisms; for this reason, essentialist beliefs have often been described as beliefs in an “essence placeholder” (Medin & Ortony, 1989). For example, one might not have the faintest idea what causal force makes photons what they are, but still believe that such a force exists. To posit an unknown essence may make people feel that they have gained a sense of understanding. This is likely to be the case for adults as well as young children. For example, if an adult with poor social adjustment is told that he has Asperger’s Syndrome, he may begin to feel that his interpersonal difficulties makes sense, and be less likely to engage in self-blame (Harmon, 2004; see also Hacking, 1995 for related arguments).

Even if children have something like a domain-general set of conceptual tools that allow them to engage in essentialist reasoning, it leaves unanswered the question of why these tools are applied only in certain contexts. Indeed, a wide body of research suggests that essentialist thinking is more pervasive in some domains than others, with the clearest distinction appearing between natural kind categories (e.g., tigers) which tend to be highly essentialized, and invented artifact categories (e.g., MP3 players) which tend not to be (see Gelman, 2003).

There are many reasons children might reason about gender and other salient social categories as though they were natural kinds (Heyman & Diesendruck, 2002; Hirschfeld, 1995; Rothbart & Taylor, 1992; Taylor, 1996). One factor that is likely to play a role is the nature of the social category in question. For example, the presence of clear dichotomies may promote essentialist thinking. Thorne (1997) highlighted the fact that unlike many other social categories, such as race or ethnicity, gender tends to be seen as dichotomous, with each person permanently assigned to one category or the other. Such dichotomies may serve to hide within-group variance and reduce attention to social contextual variables that might affect between-group variance.

Cultural inputs, including linguistic factors, may also promote essentialist reasoning (Sperber, 1996). One such factor may be gendered pronouns. Pronouns in English and many other languages make it difficult to make reference to individuals without specifying their gender. Such awkwardness is often seen when people try to talk to parents about a baby when they are not sure whether the child is a boy or girl. The fact that gender is something

that must be considered as part of everyday communication may implicitly highlight the notion that the male/female dichotomy is fundamental.

Another type of input that is likely to promote essentialist reasoning about gender is the use of the generic form, in which children refer to a category as an abstract whole (see Gelman & Taylor, this volume; Gelman, Taylor, & Nguyen, 2004). For example, in the sentence “this toy is great for girls” the word “girls” is a generic form because it refers to the general category of girls rather than to any particular girls, or even to all individuals in the category. Even if the message does not overtly promote gender stereotypes, as in “men make good nurses,” the use of the generic implicitly suggests that gender is a meaningful way to carve up the world, and that the statement is generalizable across time and contexts.

Even without the use of generics, to call attention to categories as a means to classify people may promote essentialist reasoning. Bigler (1995) investigated reasoning about gender among a group of 6- to 10-year-olds who were enrolled in a summer school program. Some teachers were instructed to emphasize gender in a functional way (e.g., by giving instructions such as “all the girls put their bubble-makers in the air”) without making reference to gender stereotypes, and other teachers were instructed to refer to students by name, or to address the class as a whole. Children in the gender-emphasis condition showed a higher level of agreement with statements expressing gender stereotypes. The effect of the experimental manipulation was strongest among children who showed the least sophisticated classification skills, suggesting that the effects of highlighting gender are stronger among children who have difficulty understanding that there are many possible ways to categorize a given individual.

The beliefs of parents are also likely to play a role in children’s developing beliefs (Eccles & Jacobs, 1986; Jacobs & Eccles, 1992). In a study of 11- and 12-year-old children and their parents, Jacobs and Eccles (1992) found that mothers’ gender-stereotypic beliefs influenced their perceptions of their children’s abilities, which in turn mediated the influence of past performance on children’s self-perceptions.

Similarly, peers are likely to influence gender conceptions. For example, a peer group’s practices of separation or exclusion may promote essentialist reasoning. As is consistent with this possibility, Thorne (1997, p. 192) noted that in her ethnographic research, she observed adults and children referring to differences in the “natures” of boys and girls to justify peer exclusion. To illustrate this point, she described a group of sixth grade girls who tried to join a boys’ football game. The boys rejected the initiation and complained to a playground aide, who asked the boys why they wouldn’t let the girls join in. The boys responded: “They can’t tackle; when we tackle ‘em they cry’.”

There are also cultural practices that may increase the likelihood that children will essentialize gender, including a range of factors that amplify differences between the genders, such as hair style and dress (Gelman & Taylor, 2000). These differences may lead children to assume that differences are fundamental, and may produce differences in perception and behavior that lead to even greater gender differences. For example, when parents dress preschool girls in nice dresses, parents and teachers may try to discourage them from messy or vigorous play so as to keep their dresses nice. As a result, girls may miss out on the skill development and interpersonal experience that is likely to result from this kind of play (see Pellegrini, 1988).

These types of differences in experiences are likely to contribute to the genders appearing really different, which in turn can shape parents’ beliefs about gender differences, which then influences their children’s attitudes and behaviors (see Hacking, 1995, regarding such “looping effects of human kinds”). For example, parents of a son and a daughter may say

something such as, “I treated them pretty much the same and look how different they turned out. It must have something to do with their natural abilities and predispositions.” Consistent with the possibility that contrasting tendencies between different children can lead to greater essentialist thinking is the finding that parents with more than one child tend to reason about their children’s abilities in more essentialist ways than do parents with only one child (Himmelstein, Graham, & Weiner, 1991). However, it is not necessary that the contrast be among children family. For example, a mother might note that the behavior of her own children is different from the behaviors of other children she has seen in similar contexts. In his January 2005 speech (Summers, 2005), Lawrence Summers suggested such a contrast to justify his belief that the genders differ in fundamental ways: “I guess my experience with my two and a half-year-old twin daughters who were not given dolls and who were given trucks, and found themselves saying to each other, look, daddy truck is carrying the baby truck, tells me something. And I think it’s just something that you probably have to recognize.”

Why Don’t Children Essentialize More than they Do?

Based on the evidence we have reviewed, one might assume that essentialist reasoning is a fundamental and pervasive part of young children’s cognition, and perhaps adults’ as well. However, there are important examples of children engaging in non-essentialist reasoning. As noted previously, one instance in which essentialist reasoning is generally absent is when children are asked to reason about gender stability or constancy. One possible explanation is that young children really do view gender as stable and unchangeable but that it is not evident in the way these constructs are typically measured. For example, it is possible that children do not understand the questions in the same ways that adults do, or that certain ways of wording the questions affect children’s patterns of response (see Heyman & Legare, 2004, for related arguments). It may also be that young children know that gender reflects some sort of stable essence, but that they are confused about which properties are essential (see Gelman & Taylor, 2000).

Gelman and Taylor (2000) also point out that people can view categories in ways that are generally consistent with psychological essentialism, even when they do not expect category membership to remain stable over time. For example, adults may essentialize the behavior of “2-year-olds” even though they know membership in this category is temporary, and they may use information about such category membership to make a wide range of inferences about behavior. Indeed, references to the essential nature of 2-year-olds are often made when parents explain children’s behavior (e.g., “Two-year-olds just say ‘no’ to everything you ask them to do.”).

It may also be that young children are less likely than older individuals to expect different components of essentialist reasoning to neatly map onto other components. For example, third graders, but not first graders, inferred that unchangeable novel traits would be more likely to be detectable in the blood and brain, and less likely to have been caused by environmental factors, than changeable novel traits (Gelman, Heyman, & Legare, 2005).

Another reason children may show essentialism in some contexts but not others is that they are sensitive to subtle contextual factors when reasoning about people (e.g., Gelman & Heyman, 1999, 2000) and in other domains (e.g., Deák & Bauer, 1995; Siegler, 1996). For example, Gelman and Heyman (1999) found that 5- and 7-year-olds who learned about novel psychological characteristics in a lexicalized form (e.g., a character being described as a “carrot-eater”) were more likely to describe the characteristics as being stable over time than were their counterparts who learned about the characteristics in the form of behavioral descriptions (e.g., that a character “eats carrots whenever she can”).

Another contextual feature that can prime children to make essentialist judgments is the activation of biological causal frameworks. Heyman and Gelman (2000) found that early elementary school children tended to place greater relative emphasis on the role of nature in explaining the origins of psychological characteristics such as “smart” or “outgoing” after they had been primed with questions about the origins of physical characteristics such as ear shape. It is likely that these and other priming effects reflect the fact that methodologies can implicitly emphasize and de-emphasize different information. It is also likely the case that such sensitivity is likely to be strongest when children are unsure in their beliefs or hold conflicting naive theories.

It would not be surprising if children were able to think about gender in both essentialist and nonessentialist ways even before they reach school age. This is because nonessentialist messages are likely to be pervasive in young children’s social environments, and may even come from the same sources as essentialist messages (see Leaper & Bigler, 2004, concerning the possibility that parents may hold conflicting beliefs about gender).

Like essentialist messages, anti-essentialist messages can be either explicit (“girls can do anything boys can do”) or implicit (e.g., derived from witnessing girls participate in activities that are stereotypically male). Although essentialist biases could cause children to attend to gender differences more than to similarities, or even to forget or misremember antiessentialist information (Giles & Heyman, 2005), many such messages are likely to become part of children’s developing gender schemas.

Moreover, there may be aspects of nonessentialist thinking that young children tend to gravitate toward. For example, there is substantial evidence that young children often endorse the notion that people have the potential to dramatically improve their skills and eliminate undesirable personality characteristics. In a study of kindergartners, third graders and sixth graders, Droege and Stipek (1993) found that only sixth graders tended to think that there were limits to the extent to which one could improve in terms of academic and social competence through effort. Similarly, Lockhart, Chang, and Story (2002) found that younger children (ages 5 to 6) were more likely than older children (ages 7 to 10) to expect personality traits to change in an extreme positive direction over time. Thus, children may have general tendencies toward both essentialist and non-essentialist patterns of reasoning.

Directions for Future Research

One important goal for future research will be to more carefully examine the social contexts that promote and discourage essentialist reasoning about gender. One starting point will be to examine how phenomena that have been seen in other domains apply to children’s reasoning about gender. For example, priming children with biology-related information might encourage them to reason about gender in more essentialist ways (see Gelman & Heyman, 2000; see also Atran, 1990, concerning the possibility that essentialist reasoning about social and psychological categories is an extension of children’s generalization of knowledge in the biological domain). Another starting point would be to examine whether social contexts that foster more gender-stereotypical behavior (see Thorne, 1997) also foster essentialist reasoning. For example, does spending substantial time with same-sex peers promote essentialist reasoning to a greater extent than does spending time in mixed-sex groups (see Maccoby, 2002)?

It will be important to broaden our examination of the types of contextual factors that promote or discourage essentialist reasoning. Emotional communication is one factor that may play a role, as suggested by a study by Graham (1984) in which sixth graders performed and failed a geometric task. After the failure, the experimenter either gave no

response, expressed anger, or expressed sympathy. Children in the sympathy condition were more likely to attribute their failure on the task to low ability than were children in the other conditions, and children in the anger condition were more likely to attribute their failure on the task to insufficient effort than were children in the other conditions. These results suggest that sympathy in response to another's poor performance communicates a sense of "I believe that performance reflects something fundamental about you," while anger does not. This result suggests one possible source of gender differences in academic self-perceptions, if adults are more likely to respond with sympathy to the difficulties of girls and with anger to the difficulties of boys. Other differences in the ways adults tend to treat boys versus girls may also play a role in suggesting to children that gender differences are fundamental (see Pomerantz & Ruble, 1998, for related arguments). For example, when fathers ask sons but not daughters for help with fixing things, or more quickly offer help to a daughter who is attempting to fix something, they may be communicating the notion that males are implicitly more capable at such activities and these differences in experience between the genders may contribute to actual differences in competence in these domains.

Despite the fact that we know that children tend to essentialize gender in certain contexts, we still know relatively little about which aspects of gender they tend to essentialize, and which they tend to view as socially constructed. Although we have done some work that examines children's tendency to view aggressiveness as an essential component of masculinity (Giles & Heyman, 2004; Heyman, 2001), there is still much to learn about children's attributions about other salient gender differences. For example, do children tend to essentialize things like color preference, toy preference, or occupational choice? To the extent that they do, it will be important to consider the types of causal forces that children see as driving gender differences. Such an undertaking would force researchers to look more deeply into the nature of children's essence placeholders (Medin & Ortony, 1989). When do children start appealing to genetic or neuroanatomical factors to explain gender differences? What role might formal instruction in biology, or exposure to media reports of scientific results, play in the development of these types of causal models? This line of inquiry has the potential to illuminate longstanding debates regarding the extent to which children's causal models of social behavior are theory-like versus loosely organized skeletal frameworks (see Gopnik & Wellman, 1994).

Another important future direction is to examine how children make sense of conflicting information about gender. To develop a more thorough understanding of the development of children's gender schemas, researchers should seek to determine which sources of information children actually use to develop gender conceptions, which sources they tend to discount, and which factors determine the extent to which they weigh information from different sources. For example, do parents or peers tend to have more influence, are implicit or explicit messages more influential, and how might it vary as a function of the age of the child?

Promoting Less Rigid Beliefs

In this final section we offer some suggestions for reducing essentialist reasoning about gender, and the potentially negative implications that it carries. First, it will be important to use our knowledge of context sensitivity in children's essentialist beliefs to create social environments that discourage essentialist reasoning. For example, teachers could be taught about the consequences of grouping by gender (see Bigler, 1995).

Second, it will be important to teach anti-essentialist beliefs in ways that have been documented to result in desired changes in attitude, performance, or outcome. For example, previous research has suggested that teaching college students to reason think about

intelligence as being malleable can improve their academic performance (Aronson, Fried, & Good, 2002). Similar effects have also been seen among college freshmen who were shown videotaped interviews of upperclassmen who reported improvements in their grade-point averages since their freshman year (Wilson & Linville, 1982), which suggests that to encourage students to reason about characteristics as being malleable may lead to positive behavioral change.

Third, it might be helpful to talk to children about specific essentialist messages that they are likely to encounter, with the goal of teaching them how to evaluate such messages critically. For example, it might be beneficial to talk to children about potential reasons people might be motivated to claim that certain groups or individuals are incapable of certain achievements. Along these same lines, children as well as adults could benefit from guidance about how to interpret media reports of scientific claims. For example, one should be skeptical of claims that the potential of specific individuals or groups of people is limited, because it is simply not possible to determine in advance what an individual is capable of accomplishing in all possible environments.

Finally, in promoting more flexible gender beliefs, it will be important to openly discuss problematic issues concerning the scientific investigation of gender and development. One such issue is whether researchers should analyze for gender effects as a matter of practice, whenever the data is available. Such routine comparisons may end up exaggerating perceptions of within-group similarity and between-group difference (Thorne, 1997; see Baumeister, 1988, and Scarr, 1988, for related discussions). For example, given a generally accepted significance level of .05 in psychological research, such a practice is likely to call attention to many gender differences that result from chance. However, this risk must be weighed against the risk that without such analysis, researchers may miss important effects.

Another issue worth considering in the scientific investigation of gender and development is the extent to which social scientists should be concerned about the possibly negative effects that study results might have on people who learn about them (see Hacking, 1995; Scarr, 1988). This possibility seems reasonable to consider in light of evidence (Eccles & Jacobs, 1986) of diminished perseverance in math among girls whose mothers had learned of Benbow and Stanley's (1980) assertion that gender differences in mathematical aptitude are due to intrinsic gender differences between males and females.

Given this evidence, might some girls and women who hear Summers' arguments be more likely to attribute their difficulties in math and science to a lack of innate ability, and as a consequence be less likely to persist in these domains? Might such statements lead girls and women to worry that others are judging them with reference to negative gender stereotypes? These types of concerns were expressed by a female undergraduate majoring in urban studies who participated in a study of women's interest in the field of engineering. She said that if she were in engineering, "people would think I was tagging along, the secretary, undependable because I'm an emotional woman or might flake out to have a family. I think all around I would not be taken seriously because I'm a girl and perceived as not having the drive or the right stuff (Heyman, Martyna, & Bhatia, 2002, p. 48)." We now have substantial evidence that such concerns can indeed affect performance and important life decisions (Eccles, 1994; Steele, 1997; Steele & Aronson, 1995). Consequently, a key challenge for researchers in this area is to remain open to pursuing new directions of inquiry wherever they may lead, while simultaneously remaining aware of the very real negative consequences that gender essentialist reasoning can have for many people.

References

- Ambady N, Shih M, Kim A, Pittinsky TL. Stereotype susceptibility in children: Effects of identity activation on quantitative performance. *Psychological Science*. 2001; 12:385–390. [PubMed: 11554671]
- Aronson J, Fried CB, Good C. Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*. 2002; 38:113–125.
- Atran, S. *The cognitive foundations of natural history*. New York: Cambridge University Press; 1990.
- Bales DW, Sera MD. Preschoolers' understanding of stable and changeable characteristics. *Cognitive Development*. 1995; 10:69–107.
- Baumeister RF. Should we stop studying sex differences altogether? *American Psychologist*. 1988; 43:1092–1095.
- Bem SL. Genital knowledge and gender constancy in preschool children. *Child Development*. 1989; 60:649–662. [PubMed: 2737014]
- Benbow CP, Stanley JC. Sex differences in mathematical ability: Fact or artifact? *Science*. 1980; 210:1262–1264. [PubMed: 7434028]
- Berndt TJ, Heller KA. Gender stereotypes and social inferences: A developmental study. *Journal of Personality & Social Psychology*. 1986; 50:889–898.
- Bigler RS. The role of classification skill in moderating environmental influences on children's gender stereotyping: A study of the functional use of gender in the classroom. *Child Development*. 1995; 66:1072–1087.
- Bohan JS. Regarding gender: Essentialism, constructionism, and feminist psychology. *Psychology of Women Quarterly*. 1993; 17:5–21.
- Brewis J. Foucault, politics and organizations: (Re)-constructing sexual harassment. *Gender, Work, and Organization*. 2001; 8:37–60.
- Cain KM, Dweck CS. The relation between motivational patterns and achievement cognitions through the elementary school years. *Merrill-Palmer Quarterly*. 1995; 41:25–52.
- Ceci, SJ.; Bruck, M. *Jeopardy in the courtroom: A scientific analysis of children's testimony*. Washington, DC: American Psychological Association; 1995.
- Chiu C, Hong &, Dweck CS. Lay dispositionism and implicit theories of personality. *Journal of Personality & Social Psychology*. 1997; 73:19–30. [PubMed: 9216077]
- Deák G, Bauer PJ. The effects of task comprehension on preschoolers' and adults' categorization choices. *Journal of Experimental Child Psychology*. 1995; 60:393–427. [PubMed: 8551211]
- Droege KL, Stipek DJ. Children's use of dispositions to predict classmates' behavior. *Developmental Psychology*. 1993; 29:646–654.
- Dweck, CS. *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press/Taylor & Francis; 1999.
- Eccles JS. Understanding women's educational and occupational choices: Applying the Eccles *et al.* model of achievement-related choices. *Psychology of Women Quarterly*. 1994; 18:585–609.
- Eccles JS, Jacobs JE. Social forces shape math attitudes and performance. *Signs*. 1986; 11:367–380.
- Erdley CA, Cain KM, Loomis CC, Dumas-Hines F, Dweck CS. Relations among children's social goals, implicit personality theories, and responses to social failure. *Developmental Psychology*. 1997; 33:263–272. [PubMed: 9147835]
- Erdley CA, Dweck CS. Children's implicit personality theories as predictors of their social judgments. *Child Development*. 1993; 64:863–878. [PubMed: 8339700]
- Gelman, SA. *The essential child: Origins of essentialism in everyday thought*. London: Oxford; 2003.
- Gelman SA, Heyman GD. Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories. *Psychological Science*. 1999; 10:489–493.
- Gelman, SA.; Heyman, GD.; Legare, CH. Developmental changes in the coherence of essentialist beliefs. Paper presented at the biennial meeting of the Society for Research in Child Development; Atlanta, GA. 2005 April.

- Gelman, SA.; Taylor, MG. Gender essentialism in cognitive development. In: Miller, PH.; Scholnick, EK., editors. *Toward a feminist developmental psychology*. Florence, KY: Taylor & Frances/Routledge; 2000. p. 169-190.
- Gelman SA, Taylor MG, Nguyen SP. Mother-child conversations about gender. *Monographs of the Society for Research in Child Development*. 2004; 69:127.
- Giles, JW. On murderers and sex offenders: The sociocognitive consequences of using noun labels to refer to people who perpetrate violence. 2005. Manuscript under review
- Giles JW, Heyman GD. Preschoolers' beliefs about the stability of antisocial behavior: Implications for navigating social challenges. *Social Development*. 2003; 12:182-197.
- Giles JW, Heyman GD. When to cry over spilled milk: Young children's use of category information to guide inferences about ambiguous behavior. *Journal of Cognition and Development*. 2004; 5:359-382. [PubMed: 20953252]
- Giles JW, Heyman GD. Young children's beliefs about the relationship between gender and aggressive behavior. *Child Development*. 2005; 76:107-121. [PubMed: 15693761]
- Gilligan, C. *In a different voice: Psychological theory and women's development*. Cambridge, MA, US: Harvard University Press; 1982.
- Gjerde PF. Culture, power, and experience: Toward a person-centered cultural psychology. *Human Development*. 2004; 47:138-157.
- Gopnik, A.; Wellman, HM. The theory theory. In: Hirschfeld, L.; Gelman, S., editors. *Mapping the mind: Domain specificity in cognition and culture*. Cambridge, UK: Cambridge University Press; 1994. p. 257-293.
- Gould, SJ. *The mismeasure of man*. New York: Norton; 1981.
- Graham S. Communicating sympathy and anger to Black and White children: The cognitive (attributional) consequences of affective cues. *Journal of Personality & Social Psychology*. 1984; 47:40-54.
- Graham S, Hoehn S. Children's understanding of aggression and withdrawal as social stigmas: An attributional analysis. *Child Development*. 1995; 66:1143-1161.
- Hacking, I. The looping effects of human kinds. In: Sperber, D.; Premack, D.; Premack, AJ., editors. *Causal cognition: A multidisciplinary debate*. New York: Clarendon Press/Oxford University Press; 1995. p. 351-394.
- Harmon, A. An answer but not a cure for a social disorder that isolates many. *The New York Times*; 2004 April 29. p. A1p. A16
- Haslam, Levy. Essentialist beliefs about homosexuality: Structure and implications for prejudice. *Personality and Social Psychology Bulletin*. (in press).
- Heyman GD. Children's interpretation of ambiguous behavior: Evidence for a "boys are bad" bias. *Social Development*. 2001; 10:230-247.
- Heyman GD, Diesendruck G. The Spanish ser/estar distinction in bilingual children's reasoning about human psychological characteristics. *Developmental Psychology*. 2002; 38:407-417. [PubMed: 12005383]
- Heyman GD, Dweck CS. Children's thinking about traits: Implications for judgments of the self and others. *Child Development*. 1998; 69:391-403. [PubMed: 9586214]
- Heyman GD, Gelman SA. Beliefs about the origins of human psychological traits. *Developmental Psychology*. 2000; 36:663-678. [PubMed: 10976605]
- Heyman GD, Dweck CS, Cain KM. Young children's vulnerability to self-blame and helplessness: Relationship to beliefs about goodness. *Child Development*. 1992; 63:401-415. [PubMed: 1611943]
- Heyman GD, Legare CH. Children's beliefs about gender differences in the academic and social domains. *Sex Roles*. 2004; 50:227-236.
- Heyman GD, Martyna B, Bhatia S. Gender and achievement-related beliefs among engineering students. *Journal of Women and Minorities in Science and Engineering*. 2002; 8:43-54.
- Himelstein S, Graham S, Weiner B. An attributional analysis of maternal beliefs about the importance of child-rearing practices. *Child Development*. 1991; 62:301-310.
- Hirschfeld LA. Do children have a theory of race? *Cognition*. 1995; 54:209-252. [PubMed: 7874877]

- Jacobs JE, Eccles JS. The impact of mothers' gender-role stereotypic beliefs on mothers' and children's ability perceptions. *Journal of Personality & Social Psychology*. 1992; 63:932–944. [PubMed: 1460561]
- Landrine, H. Cultural diversity, contextualism and feminist psychology. In: Clinchy, BM.; Norem, JK., editors. *Gender psychology reader*. New York: New York University Press; 1998. p. 78-94.
- Leaper C, Bigler RS. Gendered language and sexist thought. *Monographs of the Society for Research in Child Development*. 2004; 69:128–142.
- Levy SR, Dweck CS. The impact of children's static versus dynamic conceptions of people on stereotype formation. *Child Development*. 1999; 70:1163–1180.
- Lockhart KL, Chang B, Story T. Young children's beliefs about the stability of traits: Protective optimism? *Child Development*. 2002; 73:1408–1430. [PubMed: 12361309]
- Maccoby EE. Gender and group process: A developmental perspective. *Current Directions in Psychological Science*. 2002; 11:54–58.
- Mahalingam R, Rodriguez J. Essentialism, power and cultural psychology of gender. *Journal of Cognition and Culture*. 2003; 3:157–174.
- Marcia JE. Development and validation of ego development status. *Journal of Personality & Social Psychology*. 1966; 3:551–558. [PubMed: 5939604]
- Medin, DL.; Ortony, A. Psychological essentialism. In: Vosniadou, S.; Ortony, A., editors. *Similarity and analogical reasoning*. New York: Cambridge University Press; 1989. p. 179-195.
- Oyama, S. Essentialism, women and war: Protesting too much, protesting too little. In: Gergen, MM.; Davis, SN., editors. *Toward a new psychology of gender*. Florence, KY: Taylor & Francis/Routledge; 1997. p. 521-532.
- Pellegrini AD. Elementary school children's rough-and-tumble play and social competence. *Developmental Psychology*. 1988; 24:802–806.
- Pomerantz EM, Ruble DN. The role of maternal control in the development of sex differences in child self-evaluative factors. *Child Development*. 1998; 69:458–478. [PubMed: 9586219]
- Poulin-Dubois D, Serbin LA, Eichstedt JA, Sen MG, Beissel CF. Men don't put on make-up: Toddlers' knowledge of the gender stereotyping of household activities. *Social Development*. 2002; 11:166–181.
- Rosenthal R. Covert communication in classrooms, clinics, courtrooms, and cubicles. *American Psychologist*. 2002; 57:839–849. [PubMed: 12564183]
- Rosenthal, R.; Jacobson, L. *Pygmalion in the classroom: Teacher expectation and pupils' intellectual development*. New York: Holt, Rinehart, and Winston; 1968.
- Rothbart, M.; Taylor. Category labels and social reality: Do we view social categories as natural kinds?. In: Semin, GR.; Fiedler, K., editors. *Language, interaction and social cognition*. Thousand Oaks, CA: Sage; 1992. p. 11-36.
- Scarr S. Race and gender as psychological variables. *American Psychologist*. 1988; 43:56–59. [PubMed: 3348540]
- Schulz LE, Gopnik A. Causal learning across domains. *Developmental Psychology*. 2004; 40:162–176. [PubMed: 14979758]
- Serbin LA, Poulin-Dubois D, Eichstedt JA. Infants' response to gender-inconsistent events. *Infancy*. 2002; 3:531–542.
- Siegal M, Robinson J. Order effects in children's gender-constancy responses. *Developmental Psychology*. 1987; 23:283–286.
- Siegler, RS. *Emerging minds: The process of change in children's thinking*. London: Oxford University Press; 1996.
- Smith J, Russell G. Why do males and females differ? Children's beliefs about sex differences. *Sex Roles*. 1984; 11:1111–1120.
- Sperber, D. *Explaining culture: A naturalistic approach*. Cambridge, MA: Blackwell; 1996.
- Steele CM. A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*. 1997; 52:613–629. [PubMed: 9174398]
- Steele CM, Aronson J. Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality & Social Psychology*. 1995; 69:797–811. [PubMed: 7473032]

- Stipek DJ, Gralinski JH. Children's beliefs about intelligence and school performance. *Journal of Educational Psychology*. 1996; 88:397–407.
- Summers, L. Remarks at NBER Conference on Diversifying the Science & Engineering Workforce. 2005 January 14. Retrieved September 8, 2005 from <http://www.president.harvard.edu/speeches/2005/nber.html>
- Tavris, C. The science and politics of gender research: The meanings of difference. In: Bernstein, D., editor. *Gender and motivation*. Lincoln, NE: University of Nebraska Press; 1999. p. 1-23.
- Taylor MG. The development of children's beliefs about social and biological aspects of gender differences. *Child Development*. 1996; 67:1555–1571. [PubMed: 8890500]
- Thorne, B. Children and gender: Constructions of difference. In: Gergen, M.; Davis, S., editors. *Toward a new psychology of gender: A reader*. London: Routledge; 1997. p. 185-201.
- Wilson TD, Linville PW. Improving the academic performance of college freshmen: Attribution therapy revisited. *Journal of Personality & Social Psychology*. 1982; 42:367–376.
- Wilson, TD.; Linville, PW. Harvard Crimson; 1982 January 19. Psychoanalysis Q-and-A: Steven Pinker. 2005 Retrieved September 8, 2005 from <http://www.thecrimson.com/article.aspx?ref=505366>