THE PENNSYLVANIA STATE UNIVERSITY
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DEPARTMENT OF PSYCHOLOGY

ADULTS' EXPLANATIONS OF HOW THEY DETERMINE ANOTHER PERSON'S GENDER

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ABSTRACT

Previous researchers have suggested that gender labeling is largely automatic, but it is interesting to learn if people can reflect on the bases they use in that labeling. Thus, this experiment was designed to study the qualities adults believe that they use when asked to label others as male or female. This study drew data from two samples of students who were asked about the basis they used to make male versus female categorizations in two different ways. In the first sample, tested in the "verbal condition," adults were asked to describe what cues they use to determine a person's gender. In the second sample, the "picture condition," participants were asked to label cartoon characters as male or female and then explain the bases they used for their labeling decisions. The analyses demonstrated that there was a significant difference in the types of cues named by the two samples. In the verbal condition, the majority of the types of cues reported were biological cues and cultural cues. In the picture condition, the majority of the types of cues reported were cultural cues. The results showed differences in the cues adults reported using when labeling others' gender depending on the context in which labeling was requested. The findings suggest that adults may rely on different criteria for deciding if others are male or female depending upon whether they are asked about categorizing in a verbal versus a pictorial method.

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Introduction

In order to understand the sights and sounds in one's environment, individuals must process overwhelming amounts of stimuli by condensing and simplifying this information (McGarty et al., 2002). However, by simplifying a complex world into categories, individuals can create biased realities of the environment around them (McGarty et al., 2002). These biased perceptions influence one's impressions and judgements based on an individual's category labels (i.e., labels that assign them to a certain category or social group). One such category is gender, and includes labels related to gender groups, such as male, female, man, or woman. Placing individuals into these gender label categories link the individuals with impressions and patterns attributed to the labels (Blakemore et al., 2009). For example, after learning someone is male, one might assume the individual is interested in football. These impressions may not always be correct, and associating individuals with these patterns without confirmation from the individual is called stereotyping. Stereotyping can lead to discrimination and other negative consequences. Therefore, studying how gender labeling occurs may be a precursor to understanding the specific cognitive processes behind gender stereotyping. This knowledge in turn would offer solutions to prevent gender stereotyping.

This paper will review the theories and current empirical research of gender labeling. Then, it will explain the current study, which investigates the bases adults think they use to label gender. This investigation compares the types of cues adults think they use to label others' gender in two types of gender labeling conditions.

Theoretical Perspective

How do children begin to learn the skills and knowledge for gender labeling? Due to the cognitive nature of this study, a cognitive developmental framework will be used to explain how individuals learn to label others' gender. One theory that fits into the cognitive developmental framework is Kohlberg's (1966) cognitive developmental stage theory, which explains how children learn about gender in tandem with age-related cognitive development. It emphasizes the individuals' own role in their gender development by describing the motivation to behave and think according to cultural gender expectations that they learn from the broader environment (Martin, Ruble, & Szkrybalo, 2002). Another such cognitive theory, gender schema theory, explains how children learn about gender as a function of age-related cognitive development. Gender schema theory focuses on the relationship between age-related development with environmental interactions and processing of objects, individuals, and events (Blakemore et al., 2009).

Cognitive developmental stage theory. According to Kohlberg's theory on gender constancy, children must first reach three cognitive milestones to successfully label others as male or female. As early as 2 years old, children reach the first milestone called gender identity (Kohlberg, 1966). At this stage, children achieve awareness of their own gender category and, as a result, try to learn more about their own gender from the environment (Kohlberg, 1966). The gender information a child learns, like the patterns of behavior for a boy or a girl, becomes the basis for gender labeling and their own behavioral decisions (e.g., playing and acting in gender-appropriate ways).

Kohlberg's second cognitive milestone, gender stability, is also crucial to the development of gender labeling because it builds upon who is identified as a male or female.

Occurring around 4 to 5 years old, children learn that gender remains stable overtime (Kohlberg, 1966). This stability allows a boy to understand that he will become a man in the future while a girl will become a woman in the future. Understanding the continuity of gender refines children's knowledge of who can be identified as a male or female. Therefore, gender stability sets further precedent for the male and female categories, enhancing children's ability to label gender.

The final stage of Kohlberg's theory also improves the understanding of male and female labels. At approximately 6 or 7 years of age, children learn that gender is fixed despite external or behavioral changes (Kohlberg, 1966). In other words, a child knows that someone cannot change into the other gender even if he or she acts or looks like the other gender. With this final stage, the ability to label others as male or female is improved because children can accurately decipher a male from a female regardless of his external changes. Kohlberg's (1966) three cognitive milestones explain the cognitive processes behind how children start to learn about gender, gender labeling, and how their gender knowledge is progressively refined.

Gender schema theory. The gender schema theory builds upon the cognitive developmental stage theory to describe the process of how children learn about gender information. It highlights how children learn about gender information based on their current developmental stage as well as their environmental interactions. As children acquire more knowledge about gender, that knowledge is organized into gender schemata (Blakemore et al., 2009). Gender schemata are sets of attitudes that an individual establishes from seeking and organizing gender information (Martin & Halverson, 1981). These become the basis of identification for male and female categories (Blakemore et al., 2009). For example, a child may have a schema for the types of toys girls play with. However, gender schemata can be modified

based on environmental interactions. The gender schema theory focuses on how the basic understanding of gender and subsequent development of gender schemata affect interactions and processing of objects, people, and events (Blakemore et al., 2009). For example, after watching a girl play with trucks, a child's gender schema for the types of toys girls play with may change. Because gender schemata are the rules behind gender identification, the current study investigates how schemata impact how individuals label gender.

Based on cognitive developmental theory and gender schema theory, adults will have reached an understanding of gender constancy as well as the ability to modify schemata based on environmental interactions. These tools will help create and refine the patterns used to label gender. The patterns will be discussed in the next section.

Gender Labeling

With cognitive developmental stage theory and gender schema theory laying the foundation for gender labeling, empirical evidence is needed to support these theories. Studies like Fagot and colleagues' (1986) have found that children aged 29 to 30 months old can label male and female pictures of adults and children using cultural cues (i.e., long hair for female). This finding suggests that children as early as 29 months old can develop basic gender labeling of both adults and children using cultural information based off their gender schemata. Empirical research has also found another type of information in gender schema that individuals use to label gender: biological cues. Wild and colleagues (2000) conducted a study that measured different age groups' ability to label others as male or female using only structural differences of the face. Adults and 9-year-old children were successfully able to classify the gender of both

adults and children based on biological facial cues alone. However, 7-year-old children could not classify the sex of both adults and children. This finding confirmed that individuals over the age of nine can label gender based on biological cues. Pooling findings together, there is evidence that by adulthood, biological cues and cultural cues are fully mastered. Therefore, the current study used these types of cues as a way to classify how adults think they label gender.

Implications of Gender Labeling

Because gender labeling is done by categorizing individuals based on biological or cultural cues stored in their male or female schemata, it can lead to biases and gender stereotyping. Self-identifying into a group can lead to an own-group preference and a memory bias toward more positive characteristics of their gender group (Martin & Ruble, 2004). Specifically, the gender patterns in one's own gender group can be called "in-group schemata" while the information for the other group is the "out-group schemata" (Blakemore et al., 2009). Because gender differences are already salient and functionally used in society, Bigler and colleagues (1997) tested the formation of in-group biases by using another salient category: shirt color. Bigler and colleagues (1997) used shirt color by categorizing children based on their shirt color during the experiment, though there was no preference for one color over the other. Then, children naturally identified themselves into groups based on shirt color and developed positive associations with their in-group (i.e., peers with the same shirt color). Because shirt color was a functionally salient item similar to gender, Bigler and colleagues (1997) concluded that gender labels can lead to in-group gender biases. These in-group gender biases are formed because gender differences are not only easily noticed, but also are functionally used in society. Gender

differences give an individual biases and stereotypes toward males and females based on which group is the out-group and in-group. Then, the biases and stereotypes influence an individual's judgements and interactions after they identify someone as a male or female (Martin & Halverson, 1981; Blakemore et al., 2009).

Considering that the implications of gender labeling seem to be precursors of gender stereotyping, is there a way to inhibit gender labeling? To understand whether it can be inhibited, current research has looked at how automatic gender labeling is. In Tomelleri and Castelli's (2012) study, they tested whether gender labeling occurred automatically without a specific goal. To test the automaticity, Tomelleri and Castelli (2012) measured the amplitudes of specific areas (N170 and N300) of event-related potentials or brain responses from stimuli related to social perception. High amplitudes of N170 showed the automaticity of gender labeling during the preliminary stages while high amplitudes of N300 showed the automaticity of gender labeling process during later stages (Tomelleri & Castelli, 2012). It was found that gender labeling in its preliminary stages were automatic because early processing occurred regardless of the intentionality to categorize or the complexity of the stimuli (Tomelleri & Castelli, 2012). However, it was found that gender labeling in its later stages were not automatic when faced with a complex stimulus because N300 had high amplitudes only when there was a goal to process gender of the stimulus (Tomelleri & Castelli, 2012). The cognitive system did not finish the gender categorization process when it needed more resources to categorize gender or found that the stimuli was too complex (Tomelleri & Castelli, 2012). Humans' cognitive system only proceeded if the individuals intentionally tried to categorize the stimulus (Tomelleri & Castelli, 2012). Because of their findings, Tomelleri and Castelli (2012) determined that gender labeling is a largely automatic cognitive process, designed to understand a complex social environment.

Furthering the idea that gender labeling is a largely automatic process but is also task dependent at later stages of gender labeling, Hügelschäfer and colleagues (2016) studied mechanisms to control automatic gender categorization with electrophysiological techniques. These mechanisms involve goal intentions (e.g., a goal to achieve within a time period) and if-then plans (e.g., action plans that focus on how one will achieve the goal) aimed at personal attributes of the individual instead of the individual's gender label (Gollwitzer & Oettingen, 2013; Hügelschefer et al., 2016). Hügelschäefer and colleagues (2016) found that both if-then plans and goal intentions could control the automaticity of gender labeling, but goal intentions are more effective in controlling the automaticity of gender categorization. Because the current literature on the automaticity of gender labeling has explored metacognitive strategies as a way to control the automatic processes, the current literature prompted an investigation of the metacognition behind gender labeling.

Current Study

The current study was an exploratory study, analyzing the metacognition behind gender labeling by measuring what types of gender labeling strategies were reported when adults were presented with either a verbal or picture stimulus. It is important to note that this study used separate samples for the conditions from other studies due to the exploratory nature of this study. In the verbal condition, adults were asked to recall how they label others as male or female in their everyday lives. In the picture condition, adults were asked to label the gender of a series of cartoon characters and explain how they decided on each gender label. Then, the types of strategies in both conditions were compared to determine whether the type of stimulus affected

individuals' gender labeling strategies. Based on previous research on cues (e.g. Fagot et al., 1986; Wild et al., 2000), the types of strategies analyzed in this study were biological cues, biological markers of one's gender (i.e. presence of breasts), and cultural cues, societal markers of one's gender (i.e. long hair). Based on previous studies on the automaticity of gender labeling, it is expected that the cues reported in the verbal condition will differ from the cues used in the picture condition.

Method

Participants

Participants included young adults between the ages of 17 and 23 years old. The sample in the verbal condition had 70 young adults (51.4% males, 48.6% females; Mage [SD] = 19.68 [1.23] years) while the sample in the picture condition had 135 young adults (22.2% males, 77.8% females; Mage [SD] = 18.93 [1.12] years). Both samples were primarily White. The verbal condition was 70% White, with smaller percentages of other racial ethnic groups including Asian (7.1%), Black (8.6%), Latino/Hispanic (7.1%), Arab (1.4%), and multiracial (4.3%) participants. The picture condition was 69.4% white, with smaller percentages of Asian (17%), Black (5.9%), Latino/Hispanic (5.2%), and multiracial (1.5%) participants. One individual in the picture condition chose not to disclose ethnicity (0.7%). Also, most participants in both samples reported they were heterosexual. In the verbal condition, 80.3% reported they were heterosexual and a few reported they were bisexual (4.2%) or undecided about their sexuality (1.4%). In the picture condition, 86.7% were heterosexual and only a few participants were bisexual (1.5%) or homosexual (1.5%). The participants in both samples were undergraduate students from introductory psychology classes who received course credit for their participation.

Procedure

Verbal Condition. Undergraduate students participated in an audio-recorded interview that asked an open-ended question about how individuals detect others' genders ("How do you

know if someone is a boy or a girl?"). The question was asked as part of a longer interview that included several open-ended and multiple-choice questions related to gender. Data was collected by Kingsley Schroeder under the supervision of Dr. Lynn Liben for the Cognitive Social Developmental Lab at Penn State. The IRB number for this sample is STUDY00005269.

Picture Condition. Feminine, masculine, and neutral characters from Endendijk, Groeneveld, Pol, Berkel, Hallers-Haalboom, Mesman, and Bakermans-Kranenburg's (2014) research were used to create a gender label assignment survey. Undergraduate students completed the gender label assignment questionnaire online. In the online survey, participants were prompted with an illustrated character (intentionally drawn to portray feminine, masculine, or ambiguous gender characteristics; see figures 1-3 for illustrations). The participants were then asked in an open-ended format to assign a gender label to the character ("What is the gender of this character?") and explain their label choice ("Why did you choose that gender label?"). Participants had to label and explain their label choice for 16 cartoon characters. This data was also collected by Kingsley Schroeder under the supervision of Dr. Lynn Liben for the Cognitive Social Developmental Lab at Penn State. The IRB number for this sample is STUDY00001360.

Coding

Responses from both conditions were coded into one of the following categories: (1) biological cues (e.g., presence of breasts), (2) cultural cues (e.g., wearing a dress), (3) both biological cues and cultural cues (e.g., presence of breasts and wearing a dress), or (4) cannot determine the gender (e.g., "You cannot determine the gender based only on appearance."). Responses that did not fit into the above coding scheme were coded into a separate "other"

category, and those responses were excluded from data analysis. The coders were trained by coding a random subsample of 10 participants until they achieved acceptable reliability (*Fleiss'* $\kappa = 0.81$).

In the verbal condition, three raters were trained to code the open-ended responses to the interview question. When coding the entire sample, coders agreed 84.5% of the time and achieved adequate reliability (*Fleiss'* $\kappa = 0.86$). For the picture condition, two different raters were trained to code the participants' open-ended responses that explained why they chose the gender label for each character. When coding the entire sample, the two coders agreed on 97.4% of codes and achieved excellent reliability ($\kappa = 0.92$). For both samples, final codes were chosen using the mode for each response (i.e., the code assigned by at least two coders). Complete disagreements in code (i.e., situations in which there was no modal code) were discussed and resolved in a group setting with all coders present

Results

The purpose of this experiment was to investigate metacognitive aspects of gender labeling by analyzing the cues adults reported on how they label others as male or female in two different conditions. It was hypothesized that the types of cues reported in the verbal condition and the types of cues used in the picture condition would be different. A chi-square test of independence showed that the pattern of cues differed significantly by condition, X^2 (3, N = 157) = 108.12, p < .001 (see Table 1). In the picture condition, cultural cues represented 98% of responses. In contrast, cultural cues represented only 19% of responses in the verbal condition. Instead, ‘biological and cultural cues’ dominated the responses in verbal condition (50%).

Discussion

The purpose of this study was to understand the metacognitive processes of gender labeling by learning what adults believe are the bases for labeling others as male or female. The results show that there was a significant difference between the types of gender labeling cues reported in the verbal condition and the types of gender labeling cues reported in the picture condition. In the verbal condition, the majority of the adults reported that they used biological and cultural cues to label others as male or female. In the picture condition, the majority of the adults reported that they used cultural cues to label the gender of the cartoon.

Because the results showed inconsistencies in the types of cues adults reported in labeling others' gender between the two conditions, it showed that adults may rely on different criteria to decide whether someone is a male or female. For the verbal condition, the majority of the adults may have reported both biological and cultural cues as a strategy to categorize others' gender because adults understand that cultural cues are not always accurate. For example, achieving the last cognitive milestone of Kohlberg's theory of gender constancy allows children to understand that a boy is still a boy, even if he wears a dress (Kohlberg, 1966). This ability to be flexible increases with age and is associated with the modification of gender schemas or ideas of what a male or female is like (Martin & Ruble, 2004). Therefore, adults may have thought they utilized biological cues as well as cultural cues to label others as male or female because they understand that cultural cues are not always an accurate representation of one's sex.

For the pictorial condition, the majority of the adults may have reported only cultural cues as a strategy to categorize others' gender because they were able to actually label gender and think about how they came to that conclusion instead of abstractly thinking about how they

label others' gender on an everyday basis. In other words, reflecting on gender labeling processes immediately after labeling the gender of the cartoons characters may have given them a better idea on how they label gender. Additionally, adults may have only reported cultural cues in the picture condition because the ability to use cultural cues to label gender fully develop before the ability to use biological cues. According to Fagot and colleagues (1986), children ages 29 to 30 months old can already label the gender of adults and children using cultural cues. Compared to biological cues, Wild and colleagues (2000) found that children, ages 9 and above, were able to accurately categorize the gender of adults and children, using only biological cues of the face. Therefore, this comparison suggests that individuals may rely on using cultural cues more because cultural cues are fully developed and mastered before biological cues are fully developed and mastered.

Previous research (e.g. Hügelschäfer et al., 2016; Tomelleri & Castelli, 2012) has found that gender labelling was largely automatic, which can lead to implicit biases and stereotypes (Bigler et al., 1997; Blakemore et al., 2009). This can have larger impacts on society because it influences individual's judgements. For example, there is a gender stereotype that women express emotions like sadness, fear, and love more often than men, whereas men express anger and pride more often. Plant and colleagues (2000) found that individuals interpreted male and female ambiguous and unambiguous emotional expressions based on this gender stereotype. This result showed that gender labeling led to gender stereotypes, which colored individuals' judgement. One way to counteract these gender stereotypes is by inhibiting the automatic processes of gender labeling. Hügelschäfer and colleagues (2016) found strategies focused on metacognition, like if-then plans and implementation intentions, that inhibited the automaticity of gender labeling (Hügelschäfer et al., 2016). Because these self-awareness strategies are

ultimately aimed to reduce gender labeling and therefore individuals' gender biases and stereotyping, it was necessary for the current study to take an exploratory approach and look at the metacognition behind gender labeling. Future studies should continue understanding individuals' awareness of gender labeling by measuring how implementation intentions and if-then plans may change adults' awareness on how they label others as male or female and the efficacy of these methods in reducing gender labeling and biases.

One limitation in this current study was that there were two samples for the two conditions. The study compared the types of cues reported in the verbal condition with the types of cues reported in the picture condition as a way to measure the types of cues adults think they use when they label gender. Although these two samples had similar demographics (e.g., both samples had a majority of White undergraduates), there was no direct comparison between the types of cues each participant thought they used and the types of cues the same participant actually used. A future study could directly compare the types of cues adults report with the types of cues adults use when they label someone as a male or female to investigate the types of cues an individual may use depending on the condition.

Also, future studies can improve upon the picture condition that was designed to test how adults label gender. The picture condition was designed to measure how adults label someone as a male or female. However, it may not have been generalizable to how adults label gender in their everyday social interactions. This is because the illustrated cartoon characters had less detail and gave fewer cues than an actual individual would have. The cartoon characters did not explicitly show or hint at primary and secondary sex characteristics, which may have increased the likelihood that adults reported using cultural cues more than biological cues. This may not have been an accurate representation of the cues they used to label the character. Instead, future

studies should focus on retesting the hypothesis with a gender label assignment task that includes photographs of people instead of cartoon characters.

In addition to photographs of people, future studies should focus on this difference between adults' metacognitions about gender labeling and their actual gender labeling strategies. This type of research could be possible through the use of eye-tracking, brain imaging, or other methodology that taps individuals' vision or brain functions during a gender labeling task. For example, eye-tracking technology could be used while a participant attempts to label the gender of a person in a photograph, mapping the parts of the photograph that a participant uses to infer gender. Findings from this research could reveal whether adults are truly self-aware of the cues they use to label others as male or female. In other words, this would be a test of whether adults' reflections of their gender labeling strategies are an accurate reflection of the more automatic strategies they actually use.

Overall, the results confirmed the basis for further investigation in the metacognition of gender labeling. This is because the present study found that adults' responses for the types of cues they used to label others' gender were inconsistent depending on the type of condition. This implied that adults may use different cues to decide if someone is a male or female based on if they were required to abstractly think about it or think about it after performing a gender labeling task. Because gender labeling can lead to implicit biases and stereotypes but also can be stopped by metacognitive strategies, the findings of this exploratory study confirmed the need for further research in metacognition behind gender labeling. Thus, future research should focus on the metacognition of gender labeling, allowing for better implementation of successful intervention strategies that might reduce gender stereotyping.

Appendix A: Figures

Figure 1. Masculine cartoon characters in the picture condition

Figure 2. Feminine cartoon characters in the picture condition

Figure 3. Ambiguous cartoon characters in the picture condition

Appendix B: Tables

Table 1.

Raw Frequencies for Chi-Square Test of Independence

	Verbal Condition	Picture Condition	Totals
Biological Cues	13	0	13
Cultural Cues	10	103	113
Biological & Cultural Cues	26	1	27
Can't Tell Gender	3	1	4
Totals	52	105	157

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EDUCATION

2014-Present **The Pennsylvania State University, University Park, PA**
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RESEARCH EXPERIENCE

2016-Present **Research Assistant**
Laboratory for Cognitive and Social Development Research
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- Transcribed adult and children interviews on what gender means
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- Renamed, recoded, reordered, entered, and edited raw data using SPSS.
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Oct. 2017-Present **Intern**
America Reads Program- Global Connections
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- Managed volunteers for International Speakers Program & Translation/Interpretation Services
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- Enforced rules to bystanders, committee members, and dancers during THON
- Weekly 2-3 hour meetings to learn rules and prepare for THON

Summer 2015 **Activities & Health Intern**
The Newport Community Health Center-Day Treatment
65 Valley Rd., Middletown, RI 02842
- Lead activities and health discussions with outpatients

AWARDS

2014-Present Liberal Arts Superior Academic Achievement
2014-Present Dean's List

STUDY ABROAD

Summer 2017 Study Abroad in Jaipur, Delhi, Chandigarh, India

SKILLS

Languages: Conversational in Chinese
Computer Skills: Microsoft Words, PowerPoint, Excel, SPSS
Certifications: CITI Social and Behavioral Human Subjects Research (IRB) Course, ChildLine Abuse Prevention and Reporting, Recognizing and Reporting Child Abuse: Mandated and Permissive Reporting in Pennsylvania