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Are Angry Babies Boys and Happy Babies Girls?

A paired-associate learning experiment

Expressions of happiness and affection have stereotypically been associated with women, and those of aggression and anger, with men. In this study, we ask if this association affects memory. Eleven women and 11 men had to learn the names of 24 babies by viewing their faces: 12 faces expressed happiness and 12, anger. All baby faces appeared gender neutral (in reality, half of them were girls and half, boys). Half of the happy babies were assigned a girl name and half, a boy name, and likewise with the angry babies. After trying to learn all the emotion expression and gendered name pairings of the babies, the participants were given a multiple-choice recognition test, where the face of each baby was shown and four possible names were provided (the correct one and three incorrect ones—among which, two boys' and two girls' names). As expected, there were more correct answers when learning occurred with the congruent emotion-gender pairs (happy-girls, angry-boys) than with the incongruent ones (angry-girls, happy-boys). Moreover, the incorrect names attributed to the baby faces were more often congruent with the emotion expressed: angry babies were attributed an incorrect boy name and happy girls, an incorrect girl name. Our results confirm that stereotyped associations still influence associative memory. Remembering the names of happy baby girls and angry baby boys is easier, and babies expressing happiness and anger may be easier to associate with femininity and masculinity, respectively. This research suggests that gender stereotypes are still prevalent and continue to influence our cognitive processes.

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Our perception of what we see is often subject to implicit, or unconscious, attitudes which manifest as judgments outside of an individual's awareness (Greenwald, & Banaji, 1995). Past evidence has shown that generalized associations between various emotions and gender groups exist; for example, happiness and fear have been more frequently associated with women, and anger and contempt with men (Brody & Hall, 1993; Plant et al., 2000). Similarly, women have been believed to be more likely to smile, and men to openly express anger (Briton & Hall, 1995; Brody & Hall, 1993; Dember et al., 1993; Fabes & Martin, 1991).

Evidence supporting these stereotypes pairing women with happiness and benevolence, and men with anger and aggression was only recently discovered. For instance, in 2016, Harris and colleagues showed a series of male and female photographs expressing emotion along a continuum—anger is clearly depicted at one end of the continuum, happiness at the other end, and neutral expressions in between. Along this continuum, participants had to choose the face that depicted a neutral emotional expression for female and male faces separately. Neutral male faces were attributed to angrier expressions, and neutral female faces to happier ones. In 2009, Hess and colleagues showed an androgynous face that expressed fear, anger, and happiness to varying degrees of intensity, and asked whether the face looked feminine or masculine. Their results confirm that the happier the face, the more feminine it was perceived to be, and conversely, the angrier, the more masculine. In the second study of that same paper, Hess and colleagues (2009) used male and female faces expressing fear, happiness, anger, and sadness, and found that participants were faster at judging a female face when it was happy and slower when it was angry. In line with these findings, Hofmann and colleagues (2006) showed that individuals are faster at naming happy females and angry males compared to angry females and happy males, and Becker and colleagues (2007) found that we are faster at detecting happy expressions on female faces and angry expressions on male faces. In sum, results are unequivocal: stereotyped associations between masculinity-anger and femininity-happiness exist and, consciously or not, they influence the ways we process information about gender, including memory.

Indeed, it is well established that stereotypes sway our memory: we tend to correctly recall and falsely fabricate information congruent with our stereotypes. For example, we recall happy-female and angry-male faces (i.e., stereotype congruent pairs) better than angry-female and happy-male faces (i.e., stereotype incongruent pairs; Harris et al., 2016). Similarly, it is easier to learn the names of males and females when they are angry or happy, respectively (Hofmann et al., 2006). Accordingly, we tend to falsely recognize items that are consistent with our gender stereotypes. Lenton and colleagues (2001) had participants learn words related to men or women, and when asked to recognize which words they had learned, not only did they falsely recognize words consistent with the stereotypically associated gender, but they also were most confident about those choices, even if wrong.

However, a recent longitudinal analysis demonstrated that biases linking men and women to different roles (such as science/career, and arts/family, respectively) have weakened over the last 10 years (Charlesworth & Banaji, 2021). Since there is a downward trend in biases linking gender and specific roles, we hope this would similarly be reflected in decreased biases surrounding emotions as either more feminine or masculine. In the current study, we evaluated whether memory would still be affected by stereotyped associations between gender (boys and girls) and emotion (anger and happiness, respectively) when judging real baby faces.

A paired-associate learning task was used where participants were asked to learn the names of each baby. Photographs of real babies were chosen because they appear gender-neutral (e.g., Condry & Condry, 1976), and their faces are realistic (as opposed to computer-generated faces). Given the multicultural context where this study took place, a variety of baby pictures were selected to represent diverse racial and ethnic backgrounds. It was predicted that it would be easier to recognize the names of happy babies when assigned female names, and those of angry babies when assigned male names (than the reverse). Moreover, it was predicted that when wrongly recognized, happy babies would be more often given an incorrect girl name and angry babies, an incorrect boy name.

METHOD

Participants

Twenty-two students from York University's Glendon College participated in the experiment: 11 women (M_{age}=20.00, *SD* =2.19) and 11 men (M_{age}=20.18, *SD*=1.99). All participants provided informed consent. The study was approved by the Delegated Research Ethics Review Committee of the Psychology Department at Glendon College.

Materials and Procedure

Photographs of baby faces expressing anger and happiness were selected from online databases of public and private domain (A3pfamily, 2021; Gelpi, 2021; Paul Hakimata Photography, 2021; Valentsova, n.d.).[1] For each baby face selected, 60 students (who were the same age and education level as the study participants) were asked to identify what emotion each baby expressed. Faces that were identified as expressing anger or happiness by at least 90% of the students were used in the experiment, totalling 24 faces. While in reality 12 babies were girls and 12, boys, pictures were standardized to appear gender neutral. They were rendered in black and white, cropped so that the hairline was not apparent, and all gender cues such as hair bows, and earrings were removed (see examples of baby faces in figure 1). The pictures selected were racially and ethnically diverse, including babies of

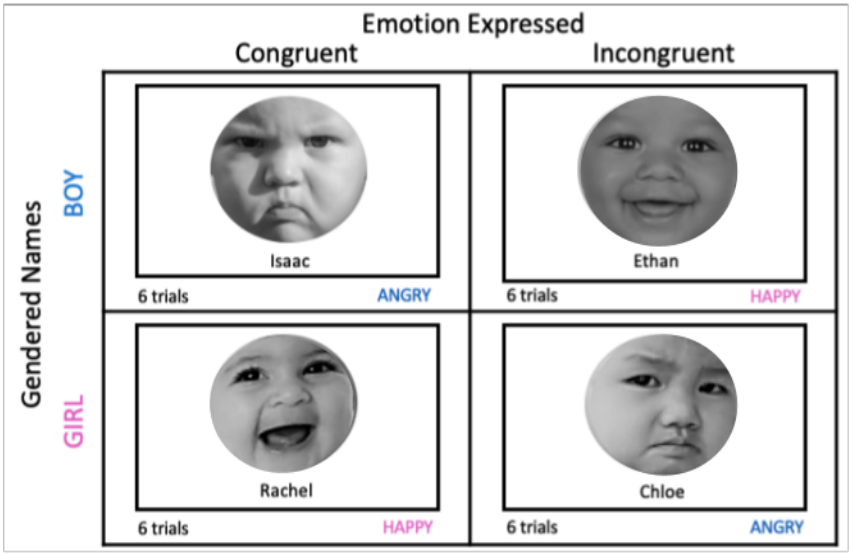
[1] References to all photographs shown in this paper are provided. References for all other images used in the experiment are available upon request.

Caucasian, Black, Asian, and Latin descent, to match the multicultural context of Toronto, where data were collected.

Twenty-four boy and girl names were paired with each picture. The names were selected from a list of the top 100 most popular first names in the U.S. to fit the following criteria: all names had two syllables and each started with a different letter (BabyCenter, 2021). Most important of all, the chosen boy and girl names had to unambiguously represent one gender or the other, and the names had to be equally common for their respective genders.

Each baby face was paired with a name (resulting in a total of 24 pairs). Of the 24 babies, 12 expressed happiness (six paired with a girl name and six paired with a boy name), and 12 expressed anger (six paired with a girl name and six paired with a boy name). This led to four emotion and gendered name pairing conditions (illustrated in figure 1): two congruent with the stereotype (happy-girl name and angry-boy name), and two incongruent with the stereotype (angry-girl name and happy-boy name). To counterbalance the emotion and gendered name pairings across participants, four different sequences of the 24 pairings were created, and one of four versions was presented at random to a quarter of all participants.

Figure 1. Examples of Emotion Expression and Gendered Name Pairing Conditions[2]



Note. Figure 1 presents four examples of baby faces expressing emotion paired with boy and girl names: two angry faces (one named Isaac, one named Chloe) and two

[2] The images used in figure 1 replace original images used in the experiment. To respect copyright regulations, the original images could not be used in this publication as the necessary permissions were not provided.

happy faces (one named Ethan, one named Rachel). The pairing of gendered names and emotion expressed led to four conditions—two stereotype-congruent: angry-boy (here, named Isaac) and happy-girl (here, named Rachel); and two stereotype-incongruent: happy-boy (here, named Ethan), and angry-girl (here, named Chloe).

Using the PowerPoint application, a paired-associate learning task, with a learning phase and a testing phase, was designed using these expressive baby faces—each, associated with a gendered name. In the learning phase, each participant was shown 24 pairs of baby faces along with their names, one baby at a time, for five seconds (using animation in PowerPoint). Participants were asked to learn the name of each baby. The testing phase followed the learning phase. In the testing phase, participants were shown each baby in a random order and given a choice of four names (two boy names and two girl names, one correct and three incorrect).[3] To the best of their abilities, participants had to choose the baby's correct name, learned previously. One baby was presented per PowerPoint slide and, at their own pace, participants wrote their choice on a piece of paper. Once their choice was made, they moved on to the next slide and could not look back at previous baby faces. An example of a baby and its name choices is shown in figure 2.

Figure 2. Example of PowerPoint Slide in Testing Phase

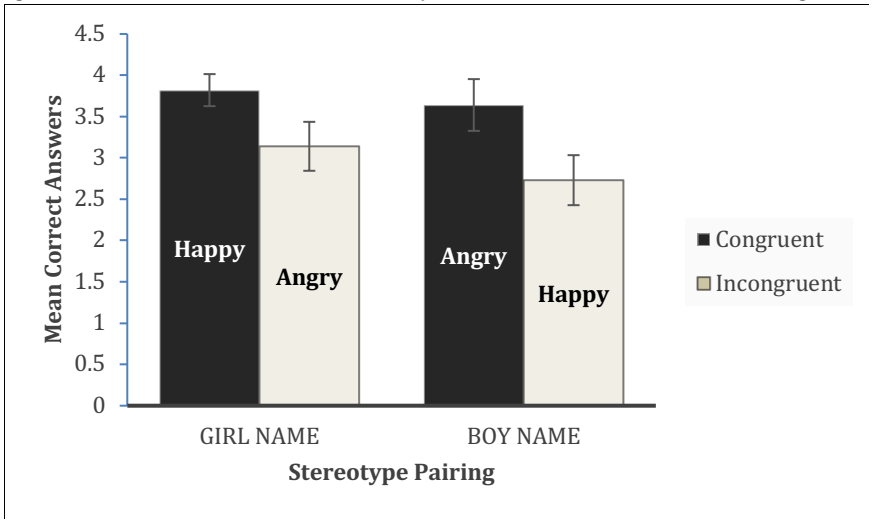
[3] The choices of names were strategically organized so that each would belong to one of the four different pairing conditions of gendered names and emotion expression. Specifically, if the baby face shown on the slide and its correct name were from one condition (e.g., stereotype-congruent), one of the incorrect choices offered was from the same condition, and two from the opposite condition. For example, in figure 2, imagine that the correct name of this angry baby is David (stereotype-congruent pair). One of the incorrect name choices offered is another boy name (stereotype-congruent; here, Caleb) and two are girl names (stereotype-incongruent; here, Lily and Jasmine).

Note. Figure 2 presents an example of one baby face with its name choices offered during the testing phase. The name choices included two male and two female names; one is correct and three are incorrect. Here, an angry baby face is presented with four name options (Caleb, Lily, David, and Jasmine).

RESULTS

For each condition, the number of correctly chosen names was calculated (see figure 3). The results show that there are more correct answers for stereotype congruent (happy-girl/angry-boy) than incongruent pairs (angry-girl/happy-boy).

Figure 3. Correct Answers for Emotion Expression and Gendered Name Pairing



Note. Figure 3 presents a bar graph for correct answers (with associated error bars) for baby faces expressing different emotions and given boy and girl names, for a total of four conditions—two stereotype-congruent: angry-boys and happy-girls; and two stereotype-incongruent: happy-boys and angry-girls. In this graph, the bars show participants had more correct answers in stereotype-congruent conditions than in stereotype-incongruent conditions.

A 2x2 statistical analysis (target gender by stereotype pairing) was conducted on participants' correct answers with the independent variables: stereotype pairing (congruent and incongruent) and gendered names (girl name and boy name). As expected, more correct answers were provided in the stereotype-congruent conditions (angry-boys and happy-girls) than the stereotype-incongruent conditions (happy-boys and angry-girls). This means that participants were more likely to remember face-name pairs that were congruent with the gender stereotypes.[4]

[4] A 2 (target gender) x 2 (stereotype pairing) within-subjects analysis of variance (ANOVA) was conducted on the correct answers with the independent variables. As expected, the main effect

Additionally, the number of incorrectly chosen names within the stereotype-congruent condition were calculated (i.e., when an incorrect boy name is chosen for an angry baby and an incorrect girl name is chosen for a happy baby). As predicted, there were more incorrect answers chosen to create a stereotype-congruent pair[5] than to create a stereotype-incorrect pair.[6] This means that participants were more likely to falsely indicate a gendered name that is congruent with the stereotype.[7]

DISCUSSION

The goal of the current study is to evaluate whether memory is affected by stereotyped associations between gender (boys and girls) and emotion (anger and happiness) when learning the names of real baby faces. Results suggest that we better recognize names of baby boys when they appear angry and names of baby girls when they appear happy. Moreover, results show that when we attribute an incorrect name to a baby, it is more often congruent with the stereotype: a happy baby is wrongly attributed a girl name and an angry one a boy name.

Our findings confirm that a stereotyped association between emotion expression and gender still exists and influences our cognitive processing. Findings are consistent with results showing that we process stimuli faster when the emotion depicted corresponds to its stereotyped associated gender (e.g., Becker et al., 2007; Harris et al., 2016; Hess et al., 2009; Hofmann et al., 2006). More directly, they confirm that we better recall stimuli pairing happiness with females and anger with males (e.g., Harris et al., 2016; Hofmann et al., 2006).

While our results are expected, they are important and innovative as the data were collected using realistic baby faces, and findings demonstrate that the stereotyped association between emotion expression and gender is persistent. It is crucial to realize that, while most of us would not explicitly acknowledge or report a different attitude towards males and females who express different emotions, our cognitive processing is still influenced by these stereotyped associations. Our results show that this influence can impact how we learn baby names. While not assessed here, it may even impact how we view a child—more feminine or more masculine—based on the emotions they frequently express.

Some limitations regarding our study should be noted. All participants were undergraduate students from York University's Glendon College (Toronto, Canada); therefore, generalizing the results to populations of different ages, education levels, and cultural backgrounds should be avoided. Individuals of different age groups may

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of stereotype pairing was significant, $F(1, 21)=10.90$, $p=.003$. The main effect of gendered names, $F(1, 21)=1.69$, $p=.207$, and the interaction gendered names X stereotype pairing, $F(1, 21)=0.23$, $p=.633$, were not significant.

[5] $M=6.59$, $SD=1.36$

[6] $M=4.09$, $SD=0.93$

[7] A paired t test: $t(21)=3.55$, $p=.0009$ indicated a statistically significant difference.

hold different associations or associations of varying degrees between gender and emotion expression (Siyanova-Chanturia et al., 2015). Future research should be conducted on a larger sample for more meaningful replication of these results. It would also be interesting to examine whether stereotyped associations between gender and emotion exist across participants of different age groups such as older adults and/or children. Likewise, future studies could gather racial and ethnic demographic information on participants to explore how associations between emotional expression and gender may vary across cultures (Gong et al., 2018).

Despite these limitations, it is likely that our projection of these ideals of how boys and girls are supposed to express themselves impacts the way they are treated and, as a result, strengthens the cyclical process that perpetuates these stereotypes over generations. As mentioned earlier, the stereotyped associations between men-science/career and women-arts/family have been decreasing over the last 10 years (Charlesworth & Banaji, 2021). We can hope that the stereotypes about gender groups and expression of emotions as well as their impacts on memory will eventually recede.

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