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It's Not About Who You Are, but Who You're Looking At: Recognizing Emotion in Faces

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IT'S NOT ABOUT WHO YOU ARE, BUT WHO YOU'RE LOOKING AT:

RECOGNIZING EMOTION IN FACES

This study tests the hypotheses that females may be more sensitive to expressions of emotions than males and that all individuals will better recognize the emotions of people of matched genders than mismatched genders. Our results were consistent with part of our prediction, as females recognized emotions better than males. Though females followed the prediction that participants would better recognize emotions of stimuli of their matched gender, males did not follow this prediction. Instead, male participants recognized emotions of stimuli of their mismatched gender more accurately than their matched gender. Since both males and females may be more accurate in recognizing emotion in female faces, society may have an implicit or learned ability to better read female expressions of emotion.

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Profile Illumination
E'lana Lemon

When we approach others, we can almost immediately tell how they are feeling by their facial expressions. Our ability to recognize how others are feeling is key to communicating with them because it gives us instructions for how to act. Emotional expression is used as our cue to tell us how we should go about conversing with others in order to receive reciprocal conversations. By simple observation, women seem to have a heightened sensitivity to others' emotions and are also seen as demonstrating more intense emotional expressions than men when portrayed in the media. Past researchers have noticed this unequal distribution of emotional exhibition and competency. Completed questionnaires of both males and females imply a greater emotional awareness in females than in males,[1] which may contribute to higher levels of female emotional expression. Females have also been shown to interpret emotions of others with more accuracy than males when the subjects of interest are experiencing positive emotions,[2] yet there was no difference found between ability to detect negative emotion in males and females. While this finding suggests that emotional accuracy may be best determined by the gender of the interpreter herself, another study suggests that there are certain features within only some females that contribute to greater emotional recognition ability. Women may be able to recognize emotion through others' facial expressions more accurately when they are going through a specific stage of menstruation.[3] Since males do not menstruate, their entire gender becomes null to these amplified effects. There are only certain periods of time in which women menstruate, so at any given time a large number of females may also remain unaffected. However, this finding still indicates an advantage for females over males in recognizing emotion.

Is there a natural quality or learned technique that contributes to a person's ability to recognize another person's emotional state? Re-

searchers have also suggested that females are associated with positive emotion, while males are associated with negative emotion. Participants in a study were instructed to imagine both happy and angry people and share their imagined descriptions. They were more likely to see the angry person as a male and the happy person as a female. They also associated angry words with males, while happy words were associated with females. To establish a pattern, the participants were given directions to name each person when they were shown the person's face as the experiment stimulus. Female names were more quickly given to happy faces in the stimuli, whereas male names were more quickly given to angry faces. If men really do show anger more often while women show happiness more frequently, components of this study lead to the idea that people may recognize emotion based on their own experiences with and personal exposure to them. Males may be better able to recognize emotions through facial expression on other males while females may be better able to recognize emotions through facial expression on other females. This idea may also apply to cultures as well as gender. Studies suggest emotions expressed on one person's face may be better recognized by a person in that same culture.[5] While Americans easily recognize facial expressions of emotion on other Americans, those same expressions may not be so easily recognized by people of other cultures, especially when those people are from separate hemispheres.

Is there a natural quality or learned technique that contributes to a person's ability to recognize another person's emotional state?

Does the ability to recognize another person's emotion through the expression on his or her face depend on the salience of that facial expression? Despite the research conducted and the observations made by both experts and laypeople, the question of emotional recognition remains: we have yet to discover the main factor contributing to one's accuracy for recognizing emotions of others. We tested the hypothesis that females are more sensitive to emotional cues in faces in comparison to males, while individuals are more sensitive to displays of emotion in the faces of their own gender in comparison to that of the opposite gender. To test our idea, we showed participants a PowerPoint presentation with stimuli consisting of both female and male faces. Half of the participants were female and half of the participants were male. All faces of the stimuli illustrated one of the six universal basic human emotions: happiness, sadness, anger, surprise, fear, and disgust.[6] Participants had to decide which one of the six emotions was best expressed by each stimulus.

If we are correct in our hypothesis, females will have higher levels of accuracy than males for recognizing emotion and participants will have higher levels of accuracy for detecting emotion in faces of their own gender (matched stimuli) compared to the opposite gender (mismatched stimuli). We predict that the effect of the gender of the participant on the level of accuracy for recognizing emotion differs depending on the matchedness of the stimuli. Specifically, we believe that female participants will show a positive increase in the level of accuracy when viewing matched gender stimuli compared to mismatched gender stimuli, while male participants will also show a positive increase in the level of accuracy when viewing matched gender stimuli compared to mismatched gender stimuli, but less than that of females.

Method

Participants

Thirty-four Lehigh University undergraduate students participated in this study. The participant pool was composed of students from PSYC 100 and 210 as well as volunteers. The psychology students were required to participate in this experiment either for course credit or as an obligation of their course. The volunteers were friends of the experimenters and participated with an altruistic incentive to equalize the number of male participants. There were twenty female participants and fourteen male participants.

Design

The first independent variable was Participant Gender. The two levels were Female and Male. The second independent variable was Matchedness of Gender Stimuli, which also had two levels: Matched and Mismatched. The dependent variable was the level of accuracy for recognizing emotion through the stimulus facial expression.

This experiment was a 2x2 mixed factorial design. The between-subjects variable was Participant Gender and the within-subjects variable was Matchedness of the Gender Stimuli.

Materials

Volunteers were given pre-tests before the experiment was conducted (see Appendix A for a sample question). The pre-tests were distributed to volunteers who had agreed to complete them as a favor to the experimenters. Each pre-test was the same and sent in an e-mail attached as a Word document. The pre-test contained forty white male and female faces on a grayscale, selected based on our interpretation of each of their emotions as one of Ekman's six universal basic human

Sample Pre- Test Image
"Universal Emotion" [Public domain], via LeMill

emotions. Twenty-four faces from the pre-test that had the best consensus regarding which emotion was expressed were chosen for use as stimuli for the experiment.

A PowerPoint presentation with instructions (see Appendix B) for the experiment, practice trials, and stimuli of male and female faces were shown to participants. The stimuli of the experiment were taken from the pre-test to ensure accuracy. Response sheets were also handed out; version one was given to females and version two was given to males (see Appendix C). There was no difference between the two versions; the version number was used as an organizational tool to distinguish between female and male participant responses for later scoring.

Procedure

The pre-test was given to volunteers before the subjects of the experiment participated in the experiment. Participants of the pre-test chose which of the six emotions each face best represented (happiness, sadness, anger, fear, surprise, or disgust) and recorded the gender of each stimulus, without any time constraints. We then chose twenty-four faces from the pre-test that had the best consensus regarding which emotion was expressed and used them as our stimuli for our actual test phase.

At the experiment, participants were greeted by the experimenter when they arrived and were asked to read and sign a consent form already signed by the experimenter and principal investigator. Then they read the instructions on the computer screen, which had the PowerPoint presentation already pulled up. The experimenter told them that they would be shown various faces and they would have to make simple judgments. After each stimulus appeared on the screen, participants circled their chosen emotion option out of the six universal basic human emotions listed for each corresponding stimulus. The stimuli appeared on the screen for only .15 seconds each in an effort to obtain the participants' implicit judgments. Once participant let the experimenter know that the instructions were understood, they went through practice trials to make sure they were ready to complete the experiment. Once they were finished with the practice trials and had no other questions, they participated in the experiment at their own pace and handed in the response sheet when they had completed it. They were then thanked for participation, debriefed by the experimenter, and given a copy of the consent form and the debrief form.

Results

When participants had completed the experiment, the response sheets were checked to make sure they were filled out. The response sheets were then scored for accuracy based on the "Key" response sheet with all of the correct answers. For example, if a participant answered "surprise" when the corresponding stimulus on the PowerPoint displayed "fear," that answer was considered incorrect and was included in an overall tally of the number of incorrect answers for each participant. This experiment originally had thirty-five participants. However, in the process of scoring response sheets, a version one response sheet collected from a participant was found to have nineteen incorrect answers out of twenty-four questions. This particular subject had completed the response sheet in an unusually quick period of time and had made it clear to the experimenter that she was not taking the experiment seriously. We considered this response sheet void and the participant an outlier, making our participant pool thirty-four instead of thirty-five. Since each question on the response sheet corresponded with a specific stimulus gender, the accuracy of female participants with matched and mismatched gender stimuli was recorded as well as the accuracy of male participants with matched and mismatched gender stimuli. The mean number of correct responses for each condition (Female participant/Matched Gender Stimuli, Female Participant/Mismatched Gender Stimuli, Male Participant/Matched Gender Stimuli, Male Participant/Mismatched Gender Stimuli) were calculated and used in a mixed factorial ANOVA test. These means are presented in Table 1 and Figure 1.

If our hypothesis is correct, then females should show greater accuracy (more correct answers on the response sheet) for recognizing emotion than males. The pattern of means is consistent with this prediction, as shown in Table 1 and Figure 1. The difference between the means is sig-

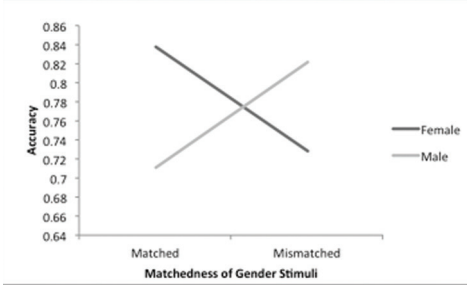

Figure 1. *Mean Number of Correct Answers on Response Sheet as a Function of Matchedness of Gender Stimuli and Participant Gender.*

nificant: F(1,32): 38.42, p<.001. This result supports our hypothesis that one gender has a significantly better ability of recognizing emotion than the other gender. Females may either have a natural aptitude or learned skill for recognizing the emotions of others through their facial expressions.

We also predicted that participants would show more accuracy toward recognizing emotions of their matched gender stimuli. This pattern of means is not consistent with our prediction, as seen in Table 1 and Figure 1. The difference between the means is not significant—F(1,32)=0, p=.993—and does not support our hypothesis. This result actually suggests a pattern that contradicts our prediction. As predicted, females showed a tendency to display more accuracy in recognizing emotions of other females than males, but males showed the same tendency in that they recognized emotions of females more accurately than emotions of other males.

With consideration to our predicted interaction effect, we received partial support for our hypothesis. We predicted that female participants would show an increased level of accuracy with matched gender stimuli, whereas male participants would show an increased but lower level of accuracy with matched gender stimuli. The interaction between Participant Gender and Matchedness of Gender Stimuli is significant: F(2,32)=8.154, p=.001. Results in Table 1 and Figure 1 show that the female participants had higher levels of accuracy for matched gender stimuli than mismatched gender stimuli, but the male participants had lower levels of accuracy for matched gender stimuli than mismatched gender stimuli.

The data we collected supports our initial hypothesis that females are more sensitive to facial expressions of emotion than males. It does not support our hypothesis that people are better at recognizing emotions of people of their matched gender rather than their mismatched gender.

Discussion

Our results suggested an enhanced female ability for accurately recognizing emotion through the facial expressions of females and males are more accurate in recognizing female emotion than male emotion. These results suggest that the key component for recognizing emotion is the person expressing the emotion instead of the person trying to read the other's expression. Both the results of this experiment and of prior research have suggested that females have greater interpretation skills for others' feelings. This study steps past these previous findings and brings up a new point of interest; the individual expressing the emotion may be the answer to recognition.

Females may not only recognize emotion others. This discovery has many different implications; it may help to explain, for instance, why more mothers stay home with children than fathers. Women may have an advantage when it comes to caring for infants. Since small children cannot express themselves through language or even through movement when they are newborns, their needs may have to be realized through their facial expressions, which have not been fully developed yet. Since females can better recognize emotions, mothers may be better equipped to imminently understand their child's needs, which would increase the given quality of care.

This experiment also showed that both females are better than males, but they may also express emotion more intensely or obviously than males as well. Since both female and male participants found female emotions easiest to judge, the reason females are able to read other females' emotions so well is not due to their own experiences with emotion. Our study is limited in that we cannot determine a cause of this possible advance in emotion recognition research. More research needs to be conducted to establish if females actually express emotion in a more intense manner than males or if society as a whole is more attuned to recognizing emotions of females than males. Both possibilities may result from nature or nurture; females may

AS PREDICTED, FEMALES SHOWED A TENDENCY TO DISPLAY MORE ACCURACY IN RECOGNIZING EMOTIONS OF OTHER FEMALES THAN MALES, BUT MALES SHOWED THE SAME TENDENCY IN THAT THEY RECOGNIZED EMOTIONS OF FEMALES MORE ACCURATELY THAN EMOTIONS OF OTHER MALES.

	Matchedness of Gender Stimuli	
	Matched	Mismatched
Participant Gender		
Female	.8377	.7281
Male	.7111	.8222

Figure 2. *Table of Mean Number of Correct Answers on a Response Sheet as a Function of Matchedness of Gender Stimuli and Participant Gender*

have a natural manner of intensely expressing emotion or they may learn how to express emotion in this way through example. People may be born with a tendency to appreciate and notice emotions of females more than males or they may become socialized by the media, stereotypes, or everyday exposure to typical societal roles to pay more attention to female emotions.[7]

> THE KEY COMPONENT FOR RECOGNIZING EMOTION IS THE PERSON EXPRESSING THE EMOTION INSTEAD OF THE PERSON TRYING TO READ THE OTHER'S EXPRESSION.

If nurture is truly the cause of greater accuracy for recognizing female emotion through facial expression, then people have the ability to improve their accuracy for recognizing male emotions as well. In literature, the media, and everyday life, men are frequently portrayed as emotionless and strong.[8] Maybe this idea of masculinity has surfaced from an evolved universal lack in the ability to accurately read male emotions. Instead of working on this problem, people may have subconsciously decided to shove it aside. In its place, they may have chosen to act like men simply do not have emotions and have worked to prove that by failing to notice them. Once this became a pattern, all males may have learned that their emotional expressions would not be acknowledged as much as the emotional expressions of females, so they gradually stopped showing emotion. Realization that the greater accuracy for recognizing emotions of females has become gradually ingrained in our minds rather than emerging from a natural male tendency for stoicism may assist in decreasing gender stereotypes. The pressure put on boys to ignore or hide their emotions may be alleviated if the general population accepted the true progression of emotional recognition for both males and females and the truth about its advancements (or lack thereof).

Although the findings of this experiment are significant and may lead to a greater understanding of human emotion and recognition, there are some limitations of our study. All experimenters are female and this may have caused a small priming effect on the participants. Since participants had to interact with the experimenters before starting the experiment, they may have noticed particular female displays of emotion and kept those expressions available in their minds. An all-female team of experimenters also means that the stimuli chosen for the pre-test and experiment might have been biased; some faces may have had certain features or traits that made their emotions easier to recognize than others. However, the pre-test may have negated some of these effects since the faces with the best consensus of both males and females were chosen for inclusion in the experiment.

An element that was not included in the stimuli of this study was cultural variety. All faces on the PowerPoint presentation were of white men and women, though they were shown on a grayscale. The lack of diversity in the appearance of the stimuli may cause some participants more difficulty than others in recognizing emotion.[9] People of certain cultures may recognize female and male faces in the same way as other members in their culture, but they may not recognize female and male emotions in the same way. This may also suggest that even though male or female emotion may not be recognized on the basis of personal experience, emotional expressions of people who belong to specific cultures may rely on that source of recognition.

This experiment opens the door for a new avenue of research. Instead of focusing on the enhanced ability females have for recognizing emotion in others, research may now center on the capability to express emotion in a universal manner to both females and males. If both genders start to evenly express their emotions, many stereotypes that lead to prejudice and sexism could diminish. Instead of seeing women as overly emotional and irrational, all people may be assumed to have similar amounts of emotion and to display them with reasonable expressions. Men may not have to suffer from the pressure to appear unaffected or without emotion if there was a general increase in the emotional recognition abilities toward males. Increased acknowledgement and acceptance of male emotion has the potential to enable more male expression and reduce unhealthy repression.

Appendix A

Recognition of Facial Emotion

- On the response sheet, circle the emotion that you think is best displayed on the face shown.
- The face will only be shown briefly so be sure to pay attention. Once you've decided upon an emotion, press the space bar to continue onto the next face.
- If you have any questions, please ask the experimenter.
- Please notify the experimenter when you have read and understood the instructions.

Appendix B

Please circle the response that best describes the emotion displayed.

Only one response is allowed per slide.

1. Happiness	2. Happiness	3. Happiness
Sadness	Sadness	Sadness
Surprise	Surprise	Surprise
Fear	Fear	Fear
Disgust	Disgust	Disgust
Anger	Anger	Anger