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Microexpressions, facial expressions lasting for less than half a second, are a common but unnoticed occurrence. The accuracy of microexpression detection, and college major choice, have both been linked with personality. This led to the hypothesis that different majors should have different levels of accuracy in detection. A convenience sample of 121 undergraduate students, of different majors, was given a short survey about microexpression detection. 10 frontal headshots, portraying examples of 7 different microexpressions, were shown on a screen. Participants were asked to identify the expressions by choosing from a provided list on the survey. There was no statistical significance in microexpression detection among majors, [F(3,118) = 0.92, p = 0.90], or between gender, t(118) = 1.23, p = 0.22. However, there was a statistically significant correlation between gender with the identification of contempt and disgust. While our results conflict with research that has already been done on emotion/microexpression detection, it is possible that another study with a larger sample could achieve results similar to existing research.

Microexpressions are fleeting facial expressions of emotion lasting less than half a second. Although little is known about how or why microexpressions form, research has shown that microexpressions are often formed unconsciously when people are trying to hide their true feelings or lie, because "inconsistent expressions [occur] more frequently in masked than in genuine expressions" (Porter & Brinke, 2008, p. 5). Microexpressions were found to be common across cultures, races, and ethnicities, with each group expressing the same six basic emotions: happiness, sadness, fear, anger, disgust, and surprise (Smith, Cottrell, Gosselin, & Schyns, 2005).

Ekman (2000), a leading researcher in the field of microexpressions, stated that Darwin first proposed the idea that expressions are universal and that Woodworth first divided emotions into six categories due to the wide range of responses from observers judging facial expression of emotion. (p.236). Darwin, Woodworth, and Ekman recognized the universality of the expression of emotion and the capacity for recognizing it. This suggests that the detection and interpretation of emotion is somewhat intuitive and that

humans possess a natural ability to recognize and respond to microexpressions.

Detection and Training

The detection and interpretation of emotion may be intuitive, but training is also available to help one become more accurate in the identification of microexpressions and emotions. A study by Matsumoto and Hwang (2011) on emotion identification and the workplace showed that those who were given training had higher ratings of social and communicative skills from a third party rater. Knowledge of how to read microexpressions increased the social skills of the department store employees in the study, suggesting that the ability to detect microexpressions can help one relate better to other people by recognizing what they are feeling. Ekman (1997) asserts that the way a stranger's face appears to an individual communicates perceived intentions and internal states, meaning that a stranger's facial expressions are some of the most important social indicators in directing an individual's behavior (as cited by Willis, Palermo, & Burke, 2011, p. 415). The ability to accurately read microexpressions can contribute to the interpretation of unspoken

social cues and can allow the observer to correctly differentiate between friend and foe, leading to better social skills and interpersonal interactions.

Training and Intuition

In addition to formal training, there is also evidence that motivational training may increase accuracy in detecting microexpressions (Hurley, 2012). Hurley (2012) hypothesized that the significant increase in accuracy after motivational training may result from "the instructor's enthusiasm provid[ing] motivation to concentrate or attend closer to the post test" (p. 379). Motivational training provides confidence to the trainee, not an increase in knowledge base or learning of a new skill. This result led to the conclusion that individuals who are motivated to learn about microexpressions are likely to score high on a microexpression identification test, even without formal training. If not given formal training, what follows is that the individual already had the skills, or ability, to recognize emotions, and microexpressions are fleeting facial expressions of emotion. This supported the hypothesis that microexpression identification is partially an unconscious and intuitive activity.

According to Dimberg, Thunberg, and Elmehed (2000), unconscious perception during face to face discussions is an important facet of communication, which may suggest why many are not aware of the presence of microexpressions in daily life. Dimberg et al. (2000) also explained that humans have emotional reactions to stimuli presented in facial expressions (e.g. Buck, 1984; Dimberg, 1997). An unconscious reaction to a stimulus, facial expressions are often hard to control because one must become aware of and consciously change one's facial expression. The unconscious facial reaction to facial expressions may explain why microexpressions exist and why many are not aware of their existence (Dimberg et al., 2000).

Detection and Individual Differences

Microexpressions are common across cultures, races, and ethnicities, and are often unconsciously perceived, but there may be individuals with a naturally heightened sense of empathy. The natural ability to empathize may lead to an increased awareness of microexpressions, even without training. EMG studies indicate that, when presented with emotional faces, individuals physically react by manipulating analogous facial muscles (Schrammel, Pannasch, Graupner, Mojzisch, & Velichkovsky, 2009). When individuals react with this similar facial expression, the feeling associated with that expression is brought to mind. Thus, even without conscious awareness, the individual is able to deduce what the other person is feeling, based on their personal interpretation of the facial expression. Personality may also play a role in the detection of microexpressions. Matsumoto and Hwang (2011) found associations between accuracy in recognizing emotions and personality traits, sociocultural adjustment and mental health (p. 181). Thus, those with differing personalities may show differing accuracies in the detection of emotion, and more specifically, microexpressions. . Balsamo, Lauriola, and Saggino (2012) pointed out that students in different majors will consistently display a difference in personality type (p. 399). As students in different majors are typically different personalities, and those with differing personalities tend to show a difference in the accuracy of emotion detection, these personality differences may lead to a difference in the accuracy of microexpression detection between those of different majors.

Holland's vocational theory indicates that students will consistently perform well if their personality fits well with their environment

(Balsamo et al., 2012). According to this theory, students who are flourishing in their respective differing majors should have different personalities. Different personalities may show a difference in the accuracy of microexpression detection. Based on this evidence, different majors should have different accuracies in microexpression detection.

One drawback to a microexpression test, rather than exposure to genuine expressions, is what Hsu and Yang (2013) described as the assimilation effect, which theorizes that "stimuli are judged as closer to immediately preceding stimuli than they actually are..." (p. 573). This could mean that participants will be more likely to judge an emotion as negative if the previous emotion shown was negative. The neutral faces that immediately precede and follow the microexpression may partially negate this effect, so the assimilation effect is not likely to skew results.

Based on previous research, we hypothesized that students in different majors would show a difference in accuracy of microexpression detection. We posed the following research questions: How will males and females differ in the identification of emotion, and will males and females differ in accuracy of microexpression detection? There is very little research on gender differences in emotion detection. This topic was chosen because of the researchers' curiosity about microexpression detection and because there is little research regarding undergraduate college students, major, and microexpression detection. Microexpressions are a fairly new field of research, and there has been some research linking personality with college major choice, and some research linking personality with emotion detection. We hoped to begin to bridge the gap between college major and emotion detection using this new field of microexpression detection.

Method

Participants

This correlational study utilized a convenience sample consisting of 121 undergraduate students (48 male and 73 female). Participants were chosen by the researchers asking professors in different disciplines for permission and time to present to their students during lecture. The participants were business (n=49), psychology (n=19), science (n=36), or "other" (n=17) majors. For our study, accounting, economics, and communication majors were classified as "business majors", and chemistry and biology majors were classified as "science majors." Any student that was not a business, science, or psychology major was considered "other" - such as an English major.

Materials

Participants were given a response sheet with a demographics section (gender and major) and 10 items which each included seven options for the microexpression identification. These options were sad, angry, surprise, fear, disgust, contempt, and happy, chosen because these are considered the "universal" expressions of emotion, pictorial representations of which can be found in the article by Lawrence, Campbell, and Skuse (2015). These options were presented as a list, for participants to circle the best answer for each separate item, as shown in Appendix A. 10 frontal headshots were displayed on a large screen at the front of the room, deemed representative of the seven microexpressions used in this study by the creator of the short quiz we used. We used a short, pre-created quiz based on the Microexpression Training Tool (METT) created by Dr. Paul Ekman (Levinson, 2007). Warren, Schertler, and Bull (2009) stated, "although there have been no validity studies of the METT, it was developed from expressions

used in the Brief Affect Recognition Test (BART), which has been shown to have good reliability and validity (Matsumoto et al. 2000)" (p. 63).

Procedure

Participants were given two copies of the consent form, one for their records and one for ours. Participants agreed to complete a survey consisting of identification of 10 microexpressions projected onto a large screen at the front of the room. Before participating in our study, participants had to sign and turn in one of the copies of the consent form. Those individuals who provided consent were shown 10 frontal headshots that represented the seven microexpressions included in this study. Then they were instructed to circle on the questionnaire the emotion they thought was portrayed in the image on the screen. Each microexpression presentation lasted less than 1/15 of a second and was preceded and followed by a neutral expression. The first microexpression was shown twice, so the participants could have an example of what they would have to identify; all other expressions were only shown once. After the surveys were completed and collected, the researchers explained microexpressions and how to identify them (muscles around the eyebrows, nose, and mouth). No data was collected from this portion of the study. Five groups were run, and each trial took about fifteen minutes, including informed consent and our explanation.

Results

Our hypothesis was that students in different majors would differ in their accuracy of microexpression detection. A two-way Analysis of Variance, with four categories for major (biology, psychology, business, and other), was performed to determine if there was a significant difference in accuracy of

microexpression detection among majors. There was no significant difference in microexpression detection by major [$F(3,3)$ = 0.915, p = 0.900], shown in Table 1.

An independent samples t-test was conducted to compare the total number of correct identifications between genders. There was no significant difference in microexpression detection between males (M=14.50, SD=2.01) and females (M=14.05, SD=1.91); t(118) = 1.23, p = 0.222, as shown in Table 1. These results suggest that there is no difference in the accuracy of microexpression detection between males and females.

A chi-square test was conducted to examine a possible association between gender and the detection of each specific microexpression. For two items, the relationship between gender and microexpression detection was significant; females tended to identify these microexpressions correctly more often than males. These were item 4 (identifying contempt), X^2 (1, N = 121) = 4.833, p = .023, shown in Table 3, and item 10 (identifying disgust), X^2 (1, N = 121) = 3.480, p = .049, shown in Table 4.

Discussion

Prior research on microexpressions and emotion detection suggested a difference among majors in the accuracy of microexpression detection. Our results contradicted this existing research, finding no significant difference, which was surprising. However, one interesting finding was that there was a significant statistical difference between the accuracy of males and females on two of the items. One was the detection of the emotion contempt, and the other was the detection of the emotion disgust. However, with other emotions displayed (happy, sad, angry, surprise, and fear), there was no significant difference. This brings up an

interesting question as to why females were more accurate at identifying these two emotions. However, there were multiple items that dealt with the identification of disgust and contempt in our study and there was not a significant difference between males and females with regards to identifying contempt and disgust in the other items. More studies could be conducted to see if this difference is widespread, outside of the limitations of our sample size. Another study could be conducted with only contempt and disgust expressed through microexpressions.

The goal of our study was to see if there was a difference in the accuracy of microexpression detection between majors. While people are hardwired to have an emotional reaction to facial expressions, different personalities may be more adept at identifying the facial stimuli that cause that reaction (Dimberg et al., 2000, p. 86). Holland's theory of vocational choice states that people with certain personality types will flourish in different academic settings (as cited in Balsamo et al., 2012), therefore people with different personality types may choose a major that interests them and matches what they believe will be their future career. Following this line of reasoning, individuals in different majors should have different personality types, and thus differ in their accuracy of microexpression identification. However, there was surprisingly no statistical significance between majors with regards to microexpression detection.

One limitation of this study is that it was conducted using a convenience sample at a small liberal arts university. We were comparing microexpression detection among majors, and while the samples of biology and business majors were roughly equal, they were significantly larger than the sample of psychology majors. The unequal representation among majors might skew our results. There was also a significant difference in sample size between males and females. Aside from our sample size, the microexpressions were shown on a screen at the front of the classroom. Those who sat in the back may not have been able to see as well as those sitting near the front, decreasing their accuracy and skewing our results. Presenting the expressions in such a large group setting may have had an impact, with participants able to see each other's' responses. Due to the research that training and exposure to microexpressions gives a slight advantage to detection, another limitation is that we did not ask at the beginning if anyone had previous knowledge of microexpressions, so we were unable to account for individual differences in detection accuracy due to previous knowledge or training.

Our study attempted to establish a connection between college major and microexpression detection. Although our findings were not what we expected, our preliminary findings of the difference between males and females in recognizing contempt and disgust were very interesting. Future research could focus on the connection between personality and microexpression detection, and also on the difference between genders in identifying a wider range of emotions. We did not include a personality inventory in our data, so this is one study which could be run later, with a focus on personality rather than college major. Previous research focused on general differences between personality and emotion detection; future research could focus on specific personalities and microexpression detection. As there was an interesting finding between gender, it would be fascinating to look into specific emotions and the difference in accuracy of detection between males and females.

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Appendix

Table 1
Tests of Between-Subjects Effects – Among Majors

Dependent Variable: Total

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.285[a]	3	.762	.195	.900
Intercept	20373.223	1	20373.223	5213.214	.000
Major	2.285	3	.762	.195	.900
Error	457.236	117	3.908		
Total	24966.000	121			
Corrected Total	459.521	120			

a. R Squared = .005 (Adjusted R Squared = -.021)

Table 2
Microexpression Detection Between Genders

		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Total	Equal variances assumed	1.2227	119	.222	.44521	.36288
	Equal variances not assumed	1.214	97.178	.228	.44521	.36661

Table 3
Accuracy of Identification of Contempt – Between Genders

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.833[a]	1	.028		
Continuity Correction[b]	3.998	1	.046		
Likelihood Ratio	4.784	1	.029		
Fisher's Exact Test				.031	.023
Linear-by-Linear Association	4.793	1	.029		
N of Valid Cases	121				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.47.
b. Computed only for a 2x2 table

Table 4
Accuracy of Identification of Disgust – Between Genders

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.480[a]	1	.062		
Continuity Correction[b]	2.752	1	.097		
Likelihood Ratio	3.434	1	.064		
Fisher's Exact Test				.067	.049
Linear-by-Linear Association	3.451	1	.063		
N of Valid Cases	121				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.49.
b. Computed only for a 2x2 table