

**Are Facial Expressions Universal? Does Optimism/Pessimism Affect The Intensity At
Which They Are Read?**

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Abstract

Using the JACFEE program (Ekman, & Matsumoto, 1988), an experiment was conducted to examine whether facial expressions are universal. It was also explored as to whether there was a relationship between optimism and pessimism and the intensity at which participants rated facial expressions, using the LOT questionnaire (Scheier, & Carver, 1985). The study was conducted with 60 participants, 15 international students and 45 European students. A positive, weak, heading to moderate, significant relationship between optimism and pessimism and the total mean intensity of happiness. No significant relationship was found between optimism and pessimism and the total mean intensity of anger. A one-way ANOVA was conducted. It found no significant difference between ethnicity and correct responses. This would suggest facial expressions are universal.

Introduction

Facial expressions are special in as much as they constitute the only information in the face that, besides mouth movements for visual speech, rapidly and constantly change in a variety of complex ways (Kaulard et al, 2012). The ability to communicate is one of the core aspects of human life. For this, we use not only verbal but also non verbal signals. Facial expressions are one of the main information channels in non verbal interpersonal communication. Facial expressions are one of the most powerful, natural and immediate means for human beings to communicate their emotions and intentions. (Zhao, & Zhang, 2011). The communication of emotion through facial expressions serves adaptive social functions.

Universality of facial expressions.

In 1872, Charles Darwin published his book 'The Expression of the Emotions in Man and Animals'. In this book, he proposed that human expressions of emotion have evolved from similar expressions in other animals. Darwin suggested that we might find evidence of expressions in other primates. If there was such evidence that some of our expressions are shared with other primates, it would therefore be consistent with the proposal that expressions are shared by all human beings, thus saying they are universal. He suggested that emotional expressions are innate, unlearned responses consisting of a complex set of movements, principally of the facial muscles (Carlson, 1994). This would suggest that a man's sneer and a wolf's snarl are similar expressions.

In his book he tells of how he came to this idea. He sent 16 questions to Englishmen travelling and living in 8 parts of the world: Africa, America, Australia, Borneo, China, India, Malaysia, and New Zealand. They wrote back and told Darwin that they saw the same expressions of emotion in the countries which they were living, as they had seen in England. This led Darwin to say “It follows, from the information thus acquired, that the same state of mind is expressed throughout the world with remarkable uniformity” (Darwin, 1872). Darwin also noted that his own children first smiled at about 45 days of age, he noted that this was too early for imitation to have played a role. From this he concluded that smiling must be innate in humans (Freedman, 1964).

In order to extract the correct meaning of the different types of facial expressions, we do not necessarily need to know the person. It would seem humans can recognize facial expressions of other humans with a certain level of accuracy and confidence (Sohail, & Bhattacharya, 2011). For example, in 1971 C.E. Izard carried out a large scale study in which American and European groups correctly identified 75%-83% of the facial photographs, whereas Japanese correctly identified 65% and Africans correctly identified only 50%. It seems that emotions are recognizable at above chance levels across cultures, but at the same time there is also cultural variation in emotion recognition accuracy.

Dr Paul Ekman proposed that there are 7 basic facial expressions. These are

1. Joy
2. Sadness
3. Fear
4. Anger
5. Disgust
6. Contempt
7. Surprise

In the 1970s, Dr Paul Ekman and W.V. Friesen developed the original Facial Action Coding System (FACS). The FACS is the most widely used method for measuring and describing facial behaviours. It was developed by determining how the contraction of each facial muscle changes the appearance of the face. In 2002, a newer version of FACS was developed by Ekman and his colleagues. It would appear that when people show emotions with their facial muscles, the left side of the face usually makes a more intense expression. An experiment was done where photographs were cut, of people who were posing emotions into right and left halves, and were then prepared into mirror images of each of them, and pasted together. It was found that the left halves were more expressive than the right ones (Sackeim et al, 1978).

A study was conducted looking at whether facial expressions develop before birth. Reissland et al (2011), defined two distinct fetal facial movements, namely cry-face-gestalt and laughter-gestalt. Both of these are made up of 7 distinct facial movements.

In this study, two healthy fetuses were scanned at different stages of development in the 2nd and 3rd trimester. Between 24 and 35 weeks the mean number of co-occurrences of 3 or more facial movements increased from 7% to 69%. Recognizable facial expressions were also observed to develop. Between 24 and 35 weeks the number of co-occurrences of 3 or more facial movements making up a cry-face-gestalt facial movement increased from 0% to 42%. The number of co-occurrences of 3 or more facial movements combining to a laughter-gestalt increased from 0% to 35%. The results from this study help to back up Darwin's theory that facial expressions are innate and not learned, for how can a fetus 'learn' facial expressions?

To what extent is the recognition of emotion universal versus variable by culture? Researchers in psychology have spent decades trying to answer that question. Especially in the last 30-40 years. It would appear that there is evidence for both universality of facial expressions and evidence that they are culturally specific.

If facial expressions are inherited, then they should take approximately the same form in people from all cultures, despite their isolation from one another (Carlson, 1994). This, and evidence for Darwin's hypothesis that facial expressions of emotion are innate, can be seen in an experiment carried out by Dr. Paul Ekman and Friesen (1971), where they studied the ability of members of an isolated tribe in New Guinea to recognize facial expressions of emotion produced by westerners. At this time the tribe could not have learned how to make or interpret expressions from outsiders or the media. They asked the tribe members to identify the emotion shown in different pictures which were presented to the tribe members. They had no trouble doing this.

Ekman asked some members of the tribe to produce certain facial expressions. He then videotaped them and then showed them to Americans. If expressions are universal, then the Americans, who had never seen any people from the New Guinea culture, should have had no trouble judging what emotion they were showing. That is exactly what happened, except fear and surprise were not distinguishable one from the other (Ekman, 1972). Because the same facial expressions were used by people who had not previously been exposed to each other, Ekman and Friesen concluded that the expressions were unlearned behavior patterns. Ekman said “they have, by large, given the same answers” (Ekman, 2001).

Karl Heider and Eleanor Rosh thought that Ekman and Friesen were wrong in their findings. They visited Dr. Ekman to discover how he had gone about with his study so that they too may carry out a similar study with The Dani people of West New Guinea and prove both Ekman and Friesen wrong. However their results, with people who were more isolated than the New Guinea tribe, were nearly identical to Ekman and Friesen’s findings (Ekman, 1972).

Like Charles Darwin, Otto Klineberg (1940) also thought that commonality in expressions between humans and another primate, such as a chimpanzee, was crucial in deciding whether human expressions are universal. He said “If expression is largely biological and innately determined, we should expect considerable similarity between two closely related species. If on the other hand, culture is largely responsible for expression, we should expect differences” (Klineberg, 1940, p.179). However, the judgments of the chimpanzee’s expressions

were not accurate. Klineberg concluded that the study actually strengthened the hypothesis of culture or of social experiences having an impact on reading facial expressions. He believed that it must be learned, at least in part.

A study was conducted by Matsumoto and Willingham in 2009 to examine the spontaneous expressions produced by blind judo athletes at the 2004 Athens Paralympic Games. A previous study had been conducted using sighted athletes at the 2004 Athens Olympic Games judo competition. This study served as a comparison (Matsumoto & Willingham, 2006). In that study, expressions that occurred immediately at the end of a gold or bronze medal match in 84 athletes from 35 countries, were captured by high speed photography and were then FACS coded.

86% of the athletes produced at least one expression at match completion, and the type of expression differentiated the results. Winners were more likely to smile, a smile that has been associated with signs of enjoyment. Defeated athletes were more likely to display sadness, contempt, or no emotion.

The Paralympic Games were an optimal choice for a comparison for the Olympic Games. Facial expressions were captured the same way as the previous study. The participants were classified according to whether they were congenitally blind or not. Their facial expressions were recorded at 3 separate times, immediately at the end of the match, when receiving their medals, and during the medal ceremonies. Their faces were then FACS coded, and the expressions were classified using an emotion dictionary called Emotion FACS according to the emotion displayed. The participants were made up of individuals who competed in the medal matches. They made

up 76 gold, silver, bronze, and fifth place winners. They represented 23 countries from 6 continents and constituted the most culturally diverse sample of blind individuals (Matsumoto, & Willingham, 2009).

“It was found that there was no difference between congenitally blind, non congenitally blind, and sighted athletes, either on the level of individual facial actions or in facial emotion configurations” (Matsumoto & Willingham, 2006). Blind athletes’ expressions differentiated whether they had won or lost a medal match at 3 different points in time, and there were no cultural differences in expressions.

These findings provide compelling evidence that the production of spontaneous facial expressions of emotion is not dependent on observational learning. It also adds support to the theory that facial expressions are universal, which has been proposed by Charles Darwin and Paul Ekman.

Even though there is much research which backs up Charles Darwin’s hypothesis, there are people who would disagree with his hypothesis. Rosenthal argued that several nonverbal behaviours are likely to be descended from a common nonverbal language, but that some of the specifics of this language vary across different cultural groups. Emotion appears to be more accurate when members of the same cultural group that express the emotional stimuli, also make the judgments (Elfenbein, & Ambady, 2003). Individuals generally pay attention to the cues that are particularly diagnostic for members of their own ethnic group. However, these cues may not help in distinguishing different facial expressions of people from different ethnic groups. This

poses the question of whether individuals can more accurately recognize emotions expressed in a style matching their own (Elfenbein, & Ambady, 2003).

A study was done by Jack et al (2012) to study the universality hypothesis. 15 Western Caucasian (WC) and 15 East Asian (EA) observers each categorized 4,800 animations, evenly split between same and other race stimuli, by emotion and intensity. In total they computed 180 models of facial expression representations per culture. The universality hypothesis predicts that in each culture, the mental models would form 6 distinct clusters, one for each emotion, because each emotion is expressed using a specific combination of facial movements common to all humans.

However, the results of the study did not show this. Instead the results showed facial expressions not to be universal. They found that WC models formed 6 distinct clusters. However, EA models overlapped considerably between emotion categories (Jack et al, 2012). This demonstrated a different, culture specific, and therefore not universal, representation of facial expressions. The temporal dynamics also showed culture specific representations of emotional intensity as mirrored by popular culture EA emoticons, “In EA, (^.^) is happy and (>.<) is angry” (Jack et al, 2012).

Their data also reflected that the 7 basic emotional facial expressions, (Joy, Anger, Disgust, Contempt, Surprise, Fear, Sadness), may be inadequate to accurately represent the conceptual space of emotions in East Asian culture. They may also neglect other emotions such shame, pride, and guilt.

Gender differences in interpreting facial expressions.

Studies have also been done to look at gender interpreting facial expressions. It is often claimed that women are superior to men at recognizing facial expressions of emotion. Female superiority in perceptual speed, the ability to rapidly absorb the details of a visual stimulus, has been recognized since the 1940s (Hampson et al, 2006). Evolutionary theories have posited that female superiority in the perception of emotion might arise from women's near universal responsibility for child rearing. The primary caretaker hypothesis proposed by Babchuk et al (1985) proposes that females, as a result of their evolutionary role as primary caretakers, will display evolved adaptations that enhance the probability of survival of their offspring. In humans, these adaptations are hypothesised to include the fast and accurate reading of facial expressions.

The child rearing hypothesis gives rise to two different predictions. According to one interpretation of the theory, the "attachment promotion" hypothesis, women should display across the board superiority, relative to men, in decoding all facial expressions of emotions because mothers who are highly responsive to infants' cries, smiles, and other nonverbal signals are likely to produce securely attached infants (Hampson et al, 2006). A second interpretation of the theory, the "fitness threat" hypothesis, assigns a special status to negative emotion including fear, disgust, sadness, and anger. Because negative emotions signal a potential threat to infant survival, for example threats to safety, which calls for action on the caretaker's part. Positive expressions carry no such imperative. Evidence of a female superiority in identification of facial

expressions is mixed. Of 55 studies reviewed by Hall (1978), only 11 (20%) found a significant superiority for females in judging emotions based on visual cues alone.

A study done by Hampson et al (2006), tested these theories. Sixty two undergraduate students, 31 males and 31 females, were given computer administered face discrimination tasks to complete. As expected, women tended to show faster performance on the perceptual speed test than men. Women were also faster than men at recognizing positive facial expressions, not just the negative ones.

Another study done by Montagne et al (2005) where video clips of neutral faces, gradually morphing into full blown expressions, were shown to participants. The participants in this study were 40 female students and 28 male students. The results from this study revealed that men were less accurate in labeling facial expressions. The men showed an overall worse performance compared to women on a task measuring the processing of emotion facial expressions.

One study was done using the Japanese and Caucasian Facial Expression of Emotion (JACFEE) images. Participants were asked to rate the presence or absence of facial expressions of emotion. It was found that females “saw relatively more of the correct emotion than men did” (Hall & Matsumoto, 2004). Although both sexes have a stake in infant survival, the ability to swiftly and accurately identify potential threat is a basis adaptation to the role of the primary care taker and would be maximized in the sex having the largest investment in each offspring. Finding a female advantage would help support the attachment promotion hypothesis.

Intensity of facial expressions.

It is well known, from everyday experience that facial expressions of emotions can very much vary in intensity (Sprengelmeyer, 2006). Take for example anger. Anger can range from mild anger to rage. This is also seen with uneasiness and mild fear to angst and panic.

A study was conducted by Sprengelmeyer in 2006, which examined the effect of different intensities of facial expressions of emotion on event related potentials. 16 healthy participants with a gender decision task to male and female faces displaying anger, disgusted, and fearful facial expressions varying in intensity (50%, 100%, and 150%), were investigated. There was a clear linear relationship between intensity and the degree of negative deflection.

Facial actions can vary in intensity. Manual Facial Action Coding System (FACS) coding for instance, uses a 5 point intensity scale ranging from Trace – Maximum, to describe intensity variation of action units. For example in the eye region, different muscles can represent intensity variation from slightly drooped eyes to closed eyes. A study by Palemo and Coltheart (2004) was conducted to examine how participants rated different facial expressions including anger, disgust, fear, happiness, neutrality, sadness, and surprise. The sex of the rater did not interact with how the participants rated the intensity of each facial expression.

A study was conducted investigating the intensity rating of facial expressions by Biele and Grabowska in 2006. The results of this study however, found a difference between genders. Males were found to have higher intensity rating for dynamic than for static expressions, this was noted in the case of anger, whereas in the case of happiness, no differences were observed.

However, for females, differences in the case of happiness and anger were significant.

The influence of the physical intensity of emotional facial expressions on perceived intensity and emotion category decoding accuracy was assessed for expressions of anger, disgust, sadness, and happiness in a study conducted by Hess, Blairy, & Kleck (1997). The facial expressions of 2 men and 2 women posing each of the four emotions were used as stimuli. Six different levels of intensity of expression were created for each pose using a graphics morphing program. 12 men and 12 women rated each of the 96 stimuli for perceived intensity of the underlying emotion and for the qualitative nature of the emotion expressed (Hess et al, 1997). The results revealed that perceived intensity varied linearly with the manipulated physical intensity of the expression. Emotion category decoding accuracy varied largely linearly with the manipulated physical intensity of the expression for expressions of anger, disgust, and sadness. For the happiness expressions only, the findings were consistent with a categorical judgment process. Sex of encoder produced significant effects for both dependent measures.

An interesting study was conducted by Bouhuys, Bloem, & Broothuis in 1995. The judgement of healthy subjects rating the emotional expressions of a set of schematic drawn faces was validated to examine the relationship between mood, for example depression or elated, and judgement of emotional expressions of the faces. This study was carried out in 2 separate studies.

In the 1st study, healthy subjects judged 12 faces with respect to the emotions they expressed, either fear, happiness, anger, sadness, disgust, surprise, rejection, and invitation

(Bouhuys et al, 1995). It was found that a particular face could reflect various emotions. All 8 emotions were reflected in the set of faces and the emotions were judged. Gender differences in the judgement of the faces was established.

The 2nd study, was a cross-over design. 24 healthy subjects judged the faces after listening to depressing or elating music (Bouhuys et al, 1995). The faces were sub-divided into 6 'ambiguous' faces. The faces expressed similar amounts of positive and negative emotions. There were also 6 'clear' faces. These faces showed an inclination of positive or negative emotions.

11 subjects, who showed substantial differences in experienced depression after listening to the music, were selected for further analysis. It was found that, when feeling more depressed, the subjects perceived more rejection or sadness in the ambiguous faces, which displayed less intensive emotions, and less invitation or happiness in clear faces. Results showed a depression related negative bias in the perception of facial displays (Bouhuys et al, 1995).

The present experiment takes this one step further to examine whether optimism or pessimism has an effect on how people rate facial expressions. However, not much research has been done on examining the effect optimism or pessimism has on rating the intensity of facial expressions of emotion. Therefore, overall, the results from this study should contribute to the literature already provided.

Therefore my hypotheses are:

1. Females will be more accurate at reading facial expressions than males.
2. Optimistic people will rate positive expressions higher and negative expressions lower.
3. Pessimistic people will rate positive expressions lower and negative expressions higher.
4. All participants from each ethnic group will be able to identify the correct facial expressions equally, indicating that facial expressions are universal.

Method

Participants

The participants in this study were 60 Dublin Business School students. These consisted of a mix of 2nd and 3rd year psychology students, and 15 international students from Dublin Business School also. These students consisted of 3 Americans, 6 Asians and 6 Africans. Overall, the participants were made up of 21 males and 39 females.

The participants for this study were gained through convenience sampling. Permission was granted for the experiment to be carried out in one of the 3rd year abnormal psychology class and one of the 2nd year bio psychology classes. To gain access to the international students, e-mail correspondence was exchanged with the international services within Dublin business School. Emails were also sent to different international societies within Dublin Business School. In addition to emails being sent, posters were developed and put up all over the college. On the day of the experiment, face to face recruitment was also used. Gaining access to international students was the most challenging, so to help gain participants, an incentive was offered to those students who volunteered to participate in the study.

Design

This experiment is a mixed design. It consists of a quasi-experiment, which is used when groups are already in place. In this case, the groups of gender and ethnicity are already in place in this experiment. It also consists of a correlational study to investigate whether optimism or pessimism has an effect on how participants rate the intensity of each facial expression.

As this experiment is a mixed design, it consists of both independent and predictor variables and dependent and criterion variables. The independent variables in this experiment are ethnicity and gender. The dependent variables in this experiment is how participants read each facial expression. For the correlation part of this experiment, the predictor variable is optimism/pessimism. The criterion variable is the intensity at which participants score each facial expression. Participants were assigned to a group depending on their ethnicity. The groups being European, American, African, & Asian. These groups were the experimental groups.

Materials

For this experiment, the JACFEE program developed by Paul Ekman and David Matsumoto in 1988 was used. The program consists of 56 colour photographs of both Caucasian and Japanese people portraying the 7 main facial expressions of emotion, joy, sadness, fear, anger, disgust, contempt and surprise. The photographs are split equally between male and female faces.

The pictures were scrambled and made into a slide show before the experiment. This slide show was then used in the experiment setting. When testing cultural differences stimulus sets must meet certain criteria. The JACFEE program was used because "JACFEE is the only set that meets these requirements" (Biehl, et al, 1997). The JACFEE program has been used before to research cultural differences in recognising facial expressions. Including studies by both Ekman and Matsumoto.

A demographic questionnaire was developed to include gender and ethnicity . Along with the demographic questionnaire, an answer booklet was developed for participants to circle which

facial expression they believed was being portrayed for each photograph. An intensity scale was also used ranging from 0-8. 0 being the lowest and 8 being the highest. 0 being "not at all", 1-3 being "a little", 4-6 being "a moderate amount" and 7-8 being "a lot".

In this experiment the Life Orientation Test (LOT) questionnaire (Scheier & Carver, 1985) was also used. This questionnaire consists of 10 questions which are answered by a number from 0-4. 0 being "I disagree a lot", 1 being "I disagree a little", 2 being "I neither agree nor disagree", 3 being "I agree a little" and 4 being "I agree a lot". (Appendix 1). This questionnaire measures people's optimism or pessimism. An empty room was also obtained to carry out the experiment with the International students.

Apparatus

For the experiments with the 2nd and 3rd years and the international students, a computer, overhead projector and projector screen were used. The slideshow was saved on a USB stick which was uploaded to the computer and then shown on the projector screen via the overhead projector.

Procedure

The experiment was carried out on 3 separate occasions. The 1st experiment was conducted with 3rd year psychology Dublin Business School students. Each student was given an answer booklet consisting of a demographic questionnaire, answer sheets, and the LOT questionnaire. (Appendix 2)

Participants were told that the experiment was researching whether or not facial expressions are universal. Participants were then told how to answer. They were told to circle their answers for each slide and to circle their intensity also. They were then told that once the slideshow was finished, there was a short 10 question questionnaire to fill out. Participants were then informed that once they had completed the questionnaire, the experiment would be over. Participants were made aware that taking part in the experiment was completely voluntary and that they may withdraw at any time.

The slideshow which had been made beforehand was then shown to participants. They had 15 seconds to view each picture and circle their responses for both facial expression and intensity. After each slide, a noise sounded to let the participants know a new picture had appeared. Altogether, the experiment took 20 minutes to complete. On completion of this experiment, it was evident that some changes had to be made as some participants had gotten confused as to which slide corresponded with which question. Some participants were also unsure of the definition of some of the emotions. Changes were then made to the slideshow.

The 2nd experiment was conducted using 2nd year psychology Dublin Business School students. Between these two experiments, changes were made to the slideshow which consisted of adding numbers on each slideshow so participants would know which slide they were looking at. Each participant was given an answer booklet as in the first experiment. Participants were told that the experiment was researching whether or not facial expressions were universal. Participants were also told a definition of each of the 7 emotions. Participants were informed that taking part in the experiment was voluntary and that they may withdraw at anytime. Participants

were told to answer by circling their response to the facial expression and intensity. Participants were informed that each slide now had a number on it to help them.

The slideshow was then shown to participants who had 15 seconds to view each slide and to answer which facial expression they believed was being shown and its intensity. This experiment also took 20 minutes to complete.

The 3rd experiment was conducted using international students . Emails were sent in advance to book a room for the duration of the experiment. Once the room had been obtained, the international students were told a time and place with which the experiment would take place.

Each participant was given an answer book like in the two previous experiments. However, this time participants were also given a page which had a definition for each of the 7 facial expressions of emotion (Appendix 3). Participants were told the nature of the study and that taking part was voluntary and they could withdraw at anytime. Participants were told how to answer their booklet, by circling their response. Participants were also informed that each slide had a number.

The slideshow was then shown to the participants who had 15 seconds to view and answer each slide. The experiment took 20 minutes to complete. At the end of the experiment, the incentive which was used to recruit the international students was then offered to the participants.

Results

The frequency for both gender and ethnicity are shown in Table 1. There were 60 participants overall. 75% were European, 5% were American, 10% were Asian, and 10% were African.

Table 1

Frequency of Ethnicity

	Frequency	Percent	Valid Percent	Cumulative Percent
European	45	75	75	75
American	3	5	5	80
Asian	6	10	10	90
African	6	10	10	100
Total	60	100	100	

As seen in Table 2, 35% of participants were male and 65% were female. Graph 1 shows how many of each gender took part in the study.

Table 2

Frequency of Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	21	35	35	35
Female	39	65	65	100
Total	60	100	100	

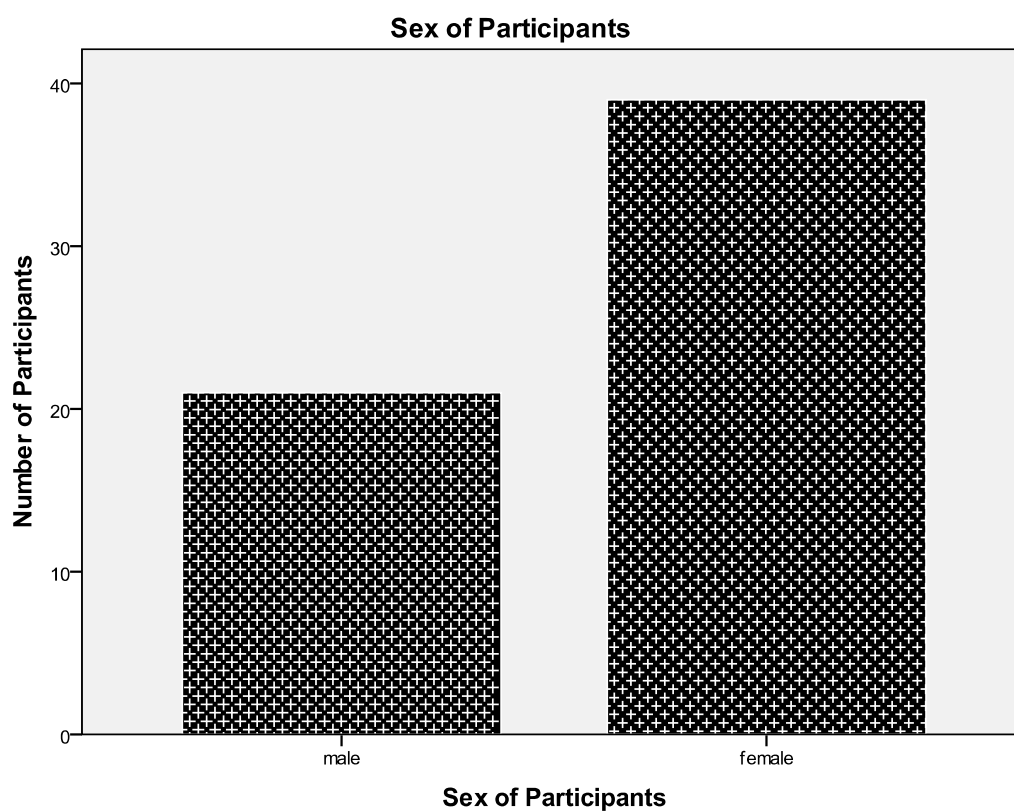


Figure 1

Number of participants for each sex.

To examine the difference between genders on optimism and correct responses two t-tests were performed. Males (mean = 15.29, SD = 4.22) were found to have higher levels of optimism than females (mean = 13.10, SD = 4.68). The 95% confidence interval shows that the population mean difference of the variables lies somewhere between -.269 and 4.635. As zero is between the upper and lower boundaries the null hypothesis cannot be rejected. An independent samples t-test found that there was no significant difference between genders ($t(58) = 1.78, p > 0.05$).

Males (mean = 45.33, SD = 6.78) were found to have higher levels of correct responses than females (mean = 43.67, SD = 5.52). The 95% confidence interval shows that the population mean difference of the variables lies somewhere between -1.576 and 4.909. As zero is between the upper and lower boundaries the null hypothesis cannot be rejected. An independent samples t-test found that there was no significant difference between genders ($t(58) = 1.03, p > 0.05$).

The total mean intensity score of each facial expression was computed. To examine whether optimism or pessimism had an effect on the intensity at which participants scored the facial expressions, 7 Spearman's Rho were conducted. A Spearman's Rho correlation found that there was no significant associations between optimism and pessimism and the total mean intensity of anger ($\rho(57) = 0.22, p = .106$).

A Spearman's Rho correlation found that there was no significant associations between optimism and pessimism and the total mean intensity of contempt ($\rho(59) = 0.08, p = .564$). A Spearman's Rho correlation found that there was no significant associations between optimism and pessimism and the total mean intensity of disgust ($\rho(57) = 0.15, p = .256$). A Spearman's

Rho correlation found that there was no significant associations between optimism and pessimism and the total mean intensity of fear ($\rho(59) = 0.24, p = .068$). A Spearman's Rho correlation found that there was a positive, weak, heading to moderate significant relationship between optimism and pessimism and the total mean intensity of happiness ($\rho(59) = .29, p = .024$). A Spearman's Rho correlation found that there was a positive, moderate significant relationship between optimism and pessimism and the total mean intensity of sadness ($\rho(58) = .33, p = .010$). A Spearman's Rho correlation found that there was a positive, moderate significant relationship between optimism and pessimism and the total mean intensity of surprise ($\rho(58) = .40, p = .002$).

To test whether there was a correlation between optimism and pessimism and the total number of correct answers, a Pearson's R correlation was performed. The mean scores for optimism and pessimism ($SD = 4.61$) and total right answers ($SD = 6.02$). A Pearson correlation found no significant relationship between optimism and pessimism and the total right answers ($r(59) = .084, p > .01$). Therefore, the null hypothesis cannot be rejected.

To examine the hypothesis that facial expressions are universal a one way ANOVA was performed. A one way analysis of variance showed that there was no significant difference between ethnicity and the total right answers. ($F(3,56) = 1.85, p > .001$).

Discussion

The aim of this study was to investigate whether facial expressions are universal. Taking it one step further, this experiment investigated whether the level of optimism or pessimism has an effect on how participants rated the intensity of facial expression.

In this experiment, males were found to have higher levels of optimism than females. A Pearson correlation found no significant correlation between optimism and pessimism and the total number of right answers. It also found no significant relationship correlation between optimism and pessimism and wrong answers. This showed that optimism or pessimism had no effect on participants' ability to recognize facial expressions.

There was no significant correlation between optimism and pessimism and the total mean intensity of anger. It was also found that there was no significant correlation between optimism and pessimism and the total mean intensity of contempt. This was also evident with the total mean intensity for both disgust and fear, that no significant correlation was found.

A positive, weak, heading to moderate, significant relationship was found between optimism and pessimism, and the total mean intensity of happiness. A positive, moderate, significant relationship was found between optimism and pessimism, and the total mean intensity of sadness. This was also the case between optimism and pessimism, and the total mean intensity of surprise.

No significant difference was found between each ethnic group and correct answers. This results supports the original hypothesis that there would be no difference between ethnic groups

and their ability to recognize facial expressions. Therefore, these results help to prove that facial expressions are universal.

Along with this data, it was found that males had higher levels of correct answers than females. This finding is in contrast to the original hypothesis stating that females would have a higher level of correct responses. This finding may be due to the fact that this experiment was carried out in a controlled setting. It was proposed by Babchuk et al (1985), that women are better at reading facial expressions to help them notice any danger so they can better protect their offspring. In a controlled setting however, females may not be fully engaged with the situation. There is nothing to be lost or gained. This however, is just speculation, further research would be recommended.

The positive, weak, heading to moderate significant relationship between optimism and pessimism and the total mean intensity of happiness, supports the original hypothesis that the higher a person's optimism the higher they will rate positive expressions. This is also the case with the positive, moderate significant relationship between optimism and pessimism and the total mean intensity of surprise.

In contrast, the positive, moderate, significant relationship between optimism and pessimism and the total mean intensity of sadness, goes against the original hypothesis that people who are pessimistic would rate the negative facial expressions high. In this case however, the higher the optimism the higher participants rated sadness. However, this may be interpreted as the more optimistic the participant, the more likely they are to recognize some facial

expressions of emotion. This however, is just speculation. Further research would be advised.

The one way ANOVA showed that there was no difference between participants of different ethnicity and their correct responses. This result supports previous research by both Darwin and Paul Ekman. Darwin (1872), proposed that facial expressions are innate and not learned. He had noticed that his own children were showing facial expressions before the time it would take to learn facial expressions. Darwin carried out his own type of experiment by asking friends in different countries different questions about facial expressions in their country. His results were evident that facial expressions are universal (Darwin, 1872). This present study helps support Darwin's theory.

This present study also adds support to Paul Ekman and Friesen's study in 1971. They travelled to New Guinea to a tribe which was isolated and could not have learned facial expressions. Their results proved strongly that facial expressions may well be universal. Karl Heider and Eleanor Rosh, tried to prove both Ekman and Friesen wrong, however, they could not.

This present research goes towards helping support many theories and research. However, research has been conducted which has found facial expressions are not universal. Elfenbein and Ambady (2003), found that emotion recognition appears to be more accurate when members of the same cultural group express the emotional stimuli. The finding of the present study contradicts Elfenbein and Ambady's study.

Studies were conducted to investigate whether males or females are better at interpreting

facial expressions. It is often claimed that women are superior to men at recognizing facial expressions of emotion. Evolutionary theories state that females are more superior than men at reading facial expressions because of women's near universal responsibility for child rearing. Babchuk et al (1985) proposed the primary caretaker hypothesis. However, the present study found that males were more superior at reading the facial expressions than the females. This is contrary to many other theories including the attachment promotion theory by Hampson et al (2006), which states that women should be superior at reading facial expressions because mothers' who are very responsive to infant's cries and smiles are likely to produce secure attachments. Another theory is the fitness threat hypothesis, which states women would be better at reading negative facial expressions so that they can predict any danger to their children. The findings of the present study do not coincide with previous studies and theories.

As stated before, it is well known from everyday experience that facial expressions of emotions can very much vary in intensity. For example, anger. Anger can range from mild anger to rage. This is also seen with uneasiness and mild fear to angst and panic. The results from this present study helps to add to a recent study conducted by Sprengelmeyer in 2006 which was conducted to examine the effect of different intensities of facial expressions of emotion on even related potential. This was done by examining 16 healthy participants with a gender decision task to male and female faces displaying anger, disgusted, and fearful facial expressions varying in intensity (50%, 100%, and 150%).

The results obtained from this study help support the experiment carried out by Palemo

and Coltheart (2004) which found that the sex of participants had no effect on how participants rated facial expression. This was also the case in the present study. The findings of the present study contradict the findings from the experiment conducted by Biele and Grabowska (2006). They found a difference in intensity ratings depending on whether the participants were male or female. A significant difference was found for females in the case of happiness and anger. Differences were noted with males also. However, this present study found no difference between males and females. Not many studies have been conducted looking at the effect of optimism and pessimism on how people rate facial expressions. This study found non significant relationships between optimism and pessimism and anger, contempt, disgust, and fear. However, positive, weak to moderate, significant relationships were found between optimism and pessimism and happiness, sadness, and surprise. The present study should help lead the way to further research in this area.

The results from the present study should help add to existing research. In particular the study conducted by Bouhuys et al in 1995. The study looked at how mood, both depressed and elated moods, had on reading facial expressions. The present study looked at optimism and pessimism in relation to intensity at which facial expression were rated. This helps to tie into the previous study. Optimism and pessimism can be related to different moods. If our mood has an effect on how we read facial expressions, then this helps to come to the conclusion that there may be a relationship between optimism and pessimism and the intensity at which participants rate facial expressions. Further study with a larger population would be highly advised to help add more to this area.

Within this study there were both strengths and weaknesses. Some strengths of this study include the access to the JACFEE program which has been tried and tested in previous research which have been examining whether facial expressions are universal. It was made by Paul Ekman and David Matsumoto, who have both conducted much research on facial expressions.

Another strength of this research is that not much research has been conducted looking at the link between optimism and pessimism and the intensity given to facial expressions. This study should hopefully add to current and previous research. It is suggested that more research be done in and around this area.

Along with strengths, this study also had weaknesses. One weakness was that it was very difficult to obtain international participants. As a result of this, there were only 15 international participants. This may have affected the outcome of this study. Further study would be greatly advised with a larger percentage of international participants. This was the most significant weakness.

Another weakness was the overall small sample size. There were only 60 participants in total. If further studies were to be conducted, it would be advised to try and obtain a larger overall sample size. If there had been a larger sample size, there may have been more significant results overall. Another weakness was the gender imbalance. There were 21 males and 39 females. This may have had an effect on the results. However, even though there were fewer males than females, males performed better.

By conducting this experiment, the findings help lead the way to future research. One idea for future research includes examining males and females again, if possible, in a non experimental setting. Also, if possible, an experiment using threatening facial expressions would be advised to examine whether female's instincts kick in like some theories suggest due to mothering instincts to protect their offspring. However, in these days, many men now look after their children as much as the mother. A study could be done to examine whether it is possible that men have learned or inherited this instinct women seem to possess when it comes to caring for offspring.

Another future research idea that has come from the findings of this research is to examine whether optimistic people can read facial expressions easier than pessimistic people. In the present study, optimism seemed to have, if only a little, effect on the ability to read happiness, sadness, and surprise. This whole area involving optimism and pessimism could benefit from further research.

The aim of this study was to investigate whether or not facial expressions are universal, and whether optimism or pessimism has an effect on how participants rated the intensity of facial expressions. It was found that males had higher levels of optimism and higher levels of correct responses. Significant relationships were found between optimism and pessimism and the total mean intensity of happiness, sadness, and surprise. No significant difference was found between ethnicity and correct answers. This would suggest that facial expressions are indeed universal.

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Appendix

Appendix 1 LOT Questionnaire

Please be as honest and accurate as you can throughout.

Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers.

Answer according to your own feelings, rather than how you think "most people" would answer.

I agree a lot	I agree a little	I neither agree nor disagree	I Disagree a little	I Disagree a lot
4	3	2	1	0

1.	In uncertain times, I usually expect the best.	
2.	It's easy for me to relax.	
3.	If something can go wrong for me, it will.	
4.	I'm always optimistic about my future.	
5.	I enjoy my friends a lot.	
6.	It's important for me to keep busy.	
7.	I hardly ever expect things to go my way.	
8.	I don't get upset too easily.	
9.	I rarely count on good things happening to me.	
10.	Overall, I expect more good things to happen to me than bad.	

Appendix 2 Full Booklet

Hello,

My name is Laura Guild and I am carrying out my 3rd year research project on the universality of facial expressions and optimism and pessimism. I would appreciate it if you would take some time and complete the questions in this booklet.

56 pictures will be displayed on the screen, for each question pick which facial expression best fits the picture from the list provided and then rate the intensity of that facial expression. **Please note:** the intensity scale is directly **below** the options of expressions. You will have 15 seconds to look at each picture. After the slideshow of facial expressions is finished, there is a questionnaire comprising of 10 questions, to be filled out also. After this, the experiment is complete. It should take about 20 minutes to complete.

You do not have to participate and can withdraw at anytime. However, if you do participate, please try to maintain concentration throughout and try to answer as honestly as you can. It is completely confidential. Each booklet is numbered, however I cannot link a person to a booklet. Should you have any questions feel free to email me anytime.

Thank you for your participation.

Laura Guild

██████████

████████████████████

Demographic Questionnaire

Please tick the appropriate box.

Gender:

Male []

Female []

Ethnicity:

European []

Please specify:

Asian []

African []

American []

Other []

Please specify:

Booklet ___

Which facial expression do you see in each picture? Also how would you rate the facial expression? 0 being very low intensity and 8 being very intense. Please circle your response.

1. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

2. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

3. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

4. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

5. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

6. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

7. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8
8. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8
9. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8
10. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8
11. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8
12. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8
13. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise
0- 1- 2- 3- 4- 5- 6- 7- 8

14. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

15. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

16. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

17. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

18. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

19. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

20. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

21. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

22. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

23. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

24. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

25. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

26. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

27. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

28. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

29. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

30. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

31. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

32. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

33. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

34. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

35. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

36. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

37. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

38. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

39. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

40. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

41. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

42. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

43. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

44. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

45. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

46. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

47. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

48. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

49. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

50. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

51. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

52. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

53. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

54. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

55. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

56. (a) Joy (b) Sadness (c) Fear (d) Anger (e) Disgust (f) Contempt (g) Surprise

0- 1- 2- 3- 4- 5- 6- 7- 8

Please be as honest and accurate as you can throughout.

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4	3	2	1	0

1.	In uncertain times, I usually expect the best.	
2.	It's easy for me to relax.	
3.	If something can go wrong for me, it will.	
4.	I'm always optimistic about my future.	
5.	I enjoy my friends a lot.	
6.	It's important for me to keep busy.	
7.	I hardly ever expect things to go my way.	
8.	I don't get upset too easily.	
9.	I rarely count on good things happening to me.	
10.	Overall, I expect more good things to happen to me than bad.	

Thank you for your participation. There are some pages at the back of the class on how to read facial expressions, if you are interested please help yourself. Should you have any questions please feel free to contact me anytime.

Laura Guild



Appendix 3: Page of definitions for each facial expression.

Definitions

Joy: the emotion of great delight or happiness

Sadness: expressive of or characterized by sorrow

Fear: a distressing emotion aroused by impending danger

Anger: a strong feeling of displeasure

Disgust: cause extreme dislike

Contempt: the state of being despised

Surprise: a sudden feeling of wonder or astonishment, as through unexpectedness