A Cultural Comparison of the Facial Inference Process

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A CULTURAL COMPARISON OF THE
FACIAL INFERANCE PROCESS

A Thesis
Presented to
The Graduate Faculty
Central Washington University

In Partial Fulfillment
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Master of Science
Experimental Psychology

by
Janine Kaitlin Swiney
May 2017
CENTRAL WASHINGTON UNIVERSITY
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ABSTRACT

A CULTURAL COMPARISON OF THE
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The purpose of this study was to compare emotion and personality trait attributions to facial expressions between American and Asian Indian samples. Data were collected using Amazon.com’s Mechanical Turk (MTurk). Participants in this study were asked to infer the emotions and personality traits shown in three facial expressions (scowling, frowning, and smiling) of young white females and males in six photographs. Each picture was randomly presented for 10 seconds followed by four randomized questions about the individual in the picture. The first question asked participants to identify the emotion shown from a list of six emotions (anger, disgust, fear, happiness, sadness, surprise). The next three questions consisted of condensed sets of the Big Five personality adjective markers (Minimarkers) (Saucier, 1994), the three Self-Assessment Manikin dimensions (SAM) (Bradley & Lang, 1994), and items related to attractiveness, perceived motivation, and morality inferences. In this study, the “Halo” and “Horns” effects were hypothesized to occur for both cultures, with some cultural differences. Smiling facial expressions (male and female) were hypothesized and found to have higher emotion judgment accuracy (happiness) and more inferred positive personality traits for both cultures (attractive, not threatening, agreeable, extroverted, pleasing to look at, positive, conscientious, and open-minded). Scowling facial expressions were hypothesized to have the following attributions: anger, unattractive, threatening.
excitable, close-minded, not pleasing to look at, bad, negative, dominant, disagreeable, and unconscientious. Frowning facial expressions were hypothesized to be perceived as: sad, unattractive, good, submissive, not threatening, not pleasing to look at, positive, and calm. The results for the smiling and frowning facial expressions showed high mean answer choice accuracy for both cultures regardless of gender in the photograph. Greater accuracy in emotion and trait attributions was hypothesized for U.S. participants because collectivist cultures (India) have trouble expressing and identifying negative emotions since they disturb the harmony of the social group (Matsumoto, 1989, 1992a; Schimmack, 1996). However, results showed that both cultures attributed the correct emotional inference and personality trait attributions to the six facial expressions for all four questions, except for the Indians on the scowling female facial expression across each of the four questions.
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CHAPTER I
INTRODUCTION
A Cultural Comparison of the Facial Inference Process

Facial expressions have conveyed a significant amount of nonverbal information throughout human evolutionary history. As an early observer of facial expressions, Charles Darwin explored whether these expressions are innate or learned in his book *The Expression of the Emotions in Man and Animals* (1872/1989). Darwin’s first principle of expression origins is that inherited expressive actions served somewhat different purposes than expressions currently serve, and that these expressions gradually evolved into voluntary forms of communication. The original purposes of expressive actions were performed to escape from danger, to relieve stress, and to gratify some desire. Darwin, influenced by Lamarck (1809/1991), thought that the constant repetition of these facial expressions led to them becoming inherited by successive generations. Although the Lamarckian origin hypothesis has been refuted, Darwin further hypothesized that humans have the universal ability to instinctively both pose and recognize certain facial expressions. Darwin gathered worldwide evidence suggesting both universal posing and emotional recognition of human facial expressions (such as the expressions related to joy, pain, anger, terror, disgust, sulkiness, despair, and suffering). He believed that this evidence provided support for instinctive recognition of a set of core underlying emotions from certain facial expressions.

Tompkins (1962), following Darwin, suggested the face is a tool of affect that transmits information about the individual to the world and receives information from the world. Tompkin’s research centered around the negative affects of shame, distress, and
anger, and his last significant work ended with the relationship between affect and
cognition of personality (Tomkins, 1963, 1991, 1992). In the 1960s, Paul Ekman,
Tomkin’s protégé, set out to systematically study the universality of emotions for the
first time (Ekman & Friesen, 1969). His research supports Darwin’s universality
hypothesis for six core facial emotional expressions (angry, sad, happy, disgusted,
surprised, and fearful) (Ekman & Friesen, 1971). Ongoing research has supported
Ekman’s cross-cultural recognition of the six facial expressions (Ekman, 1972, 1973;
Ekman & Friesen, 1971, 1986; Ekman, Sorenson, & Friesen, 1969; Izard, 1971; Ekman
& Heider, 1988; Matsumoto, 1992a). There is additional evidence of a seventh core
universal emotion, contempt (Ekman & Friesen, 1986; Matsumoto, 1992b).

Cultural similarities of experiences and reactions were found concerning the
seven core emotions (angry, sad, happy, disgusted, surprised, fearful, and contempt)
between Japanese and American participants (Scherer, Wallbott, Matsumoto, & Kudoh,
1988). The data used in Matsumoto et al. (1988) was part of a larger study involving
emotional antecedents and reactions to the same seven emotions across 27 countries
(Wallbott & Scherer, 1986). There was significant cross-cultural participant agreement
regarding the core expression and emotion connections (Wallbott & Scherer, 1986).
Scherer (2010) later confirmed the cross-cultural agreement of emotional elicitation and
differentiation regarding the seven emotions. Cross-cultural recognition of emotions is
supported by many studies and methodologies, including the emotional recognition of
facial expressions (Matsumoto, 2004; Elfenbein & Ambady, 2002a). However, even
though the facial recognition of emotions has shown to be quite accurate, there are many
factors that may influence the accuracy of judgements of the underlying personality trait attributions based on facial expressions, such as stereotypes.
CHAPTER II
LITERATURE REVIEW

Stereotypes

Although these expression and emotion associations create convenient inferential shortcuts, stereotyping may reduce the accuracy of these judgments. The word “stereotype” was used early on by Lippmann (1922) in his book *Public Opinion*. He referred to stereotypes as general cognitive structures that explain error and biases in our interpretation of the world. The most familiar definition of stereotyping is the global process of attributing characteristics to people based on their nationality, ethnicity, gender, or some other visual cue. For example, Malatesta, Fiore, and Messina (1987) found significant evidence of stereotypes for older female faces. Participants misjudged the emotional displays of older female faces in photographs primarily when the emotions were similarly negative or positive. As an example, anger misjudgments correlated with misattributions of disgust and contempt. From these results, participants could have been confusing these three facial expressions among each other.

Regarding culture, cultural stereotypes were found between Hong Kong Chinese and American participants. The Chinese participants were viewed as more emotionally controlled, less open to others, and less extroverted than American participants (Bond, 1986). Results from a study by Olivola and Todorov (2010) revealed that people frequently associate traits based on stereotypes related to facial expressions. One source behind stereotyping traits is the perception that an ambiguous facial expression may resemble another emotionally connected facial expression (Todorov, 2013; Montepare & Dobish, 2003; Neth & Martinez, 2009; Oosterhof & Todorov, 2009; Said, Sebe, &...
Todorov, 2009; Zebrowitz, Kikuchi, & Fellous, 2010). For example, if a neutral facial expression is perceived as resembling a familiar emotionally related facial expression, then the neutral expression is judged as having the personality traits of that familiar expression (Said et al., 2009; Todorov, 2013). Much stereotyping has been conceptualized within the “Halo Effect” and “Horns Effect.”

**The Halo and Horns Effects**

Evidence of grouping personality traits based on people’s appearances was first discovered by Edward Thorndike (1920). He named this phenomenon the “Halo Effect.” This occurs when we unconsciously attribute personality traits based on a positive visible global characteristic, such as attractiveness. Nisbett and Wilson (1977) found evidence of a reverse “Halo Effect,” commonly referred to as the “Horns Effect.” It occurs when a negative visible global characteristic, such as unattractive or threatening, is used to assess other personality traits a person might possess. As a stereotype, the “Halo Effect” is probably a more powerful phenomenon than one might expect. A specific, pleasing visible attribute might actually undermine an individual’s ability to accurately assess a person’s personality on a global scale (Dion, Berscheid, & Walster, 1972; Nisbett & Wilson, 1977). If we perceive a person as physically attractive, we may assume that other attributes, that we actually know little about, are positive and agreeable as well (Nisbett & Wilson, 1977). The opposite can be assumed about less attractive people.

**Attractiveness as a halo and horns effect initiator.** The positive associations more attractive faces create in the brain result in perceivers treating attractive individuals with higher respect and receiving them with positivity (Dion et al., 1972). This positive or negative social treatment of individuals based on level of attractiveness may shape
personalities and affect confidence, self-perceptions, and behavior in the perceived. The results of the Dion et al. (1972) study support a physical attractiveness stereotype that includes the presumptions that beautiful people will lead happier lives and be more successful. Physical attractiveness was found to affect the social interaction and social influence of the perceived. Attractive people are believed to possess greater material benefits and have greater happiness, which attracts more potential dating partners and marriage prospects in addition to the lure of their appearance. Higher facial attractiveness has also been shown to impact perceptions of positive attributes like trustworthiness. Furthermore, other traits related to motivation and morality, such as conscientiousness and fidelity are evaluated positively in conjunction with increased attractiveness as a mate selection strategy (Miller, 2007).

Attractiveness is an outward attribute that has evolved in the direction of advertising mate value according to mate selection theorists (Buss & Barnes, 1986; Buss & Schmitt, 1993). Mate value is based on the “good genes” theory, where the quality of an individual’s genes is assessed by the inherent presumed personality attributes and behaviors that high and low attractive individuals differentially display (Thornhill & Gangestad, 1993, 1999). Female mate value is judged by attractiveness more than males (Buss & Barnes, 1986; Buss & Schmitt, 1993). Rennels and Kayl (2015) theorized that female attractiveness might be a more accurate indicator of quality, social standing, and/or their behavior compared to men. Especially for unattractive female faces, there is a potential negativity bias for the attractiveness-expressivity association of the perceiver (Principe & Langlois, 2011). Unattractive females elicited more emotional response (disgust) compared to attractive faces (Principe & Langlois, 2011). This may be because
less attractive faces create a higher negative visual stimulation than positive or neutral stimuli during early processing (Smith, Cacioppo, Larsen, & Chartrand, 2003). Research has shown that females with low attractiveness are rated more negatively than medium and highly attractive females (Griffin & Langlois, 2006). However, regardless of the rated or rater’s gender, more attractive faces take longer to judge than less attractive faces because it is adaptive to prefer healthy (attractive) than unhealthy (unattractive) individuals (Ishai, 2007; Werheid et al., 2007; Zebrowitz, 2004).

Many socially concerned observers once believed that beauty is irrelevant to the trait inference process, but the evidence shows otherwise (Dion, et al., 1972). Physical beauty might be only skin deep, but the effects on our perceptions are unconsciously profound, despite some observers hoping to prove the opposite. Another facial feature that has been examined as an initiator of the halo and horns effects is babyfaced-ness.

**Babyfaced-ness and mature faces as halo and horns effects initiators.** Some studies have compared the positive reactions to both attractiveness and babyfaced-ness. Zebrowitz and Franklin (2014) investigated the attractiveness halo effect and babyface stereotype (more positive reactions to babyfaced people) reactions to older and younger neutral expressions. Old adult and young adult participants exhibited an attractiveness halo effect and the babyfaced stereotype for both old and young faces, but stronger attractiveness and babyfaced stereotype reactions were found for faces closer to the participants’ age. In small claims court, the more attractive plaintiffs were, the more likely they were to win cases. However, when baby-facedness increased in defendants, they won more cases involving negligent actions and were rewarded larger monetary compensation (Zebrowitz & McDonald, 1991).
As the perception of baby-facedness increases, those individuals are judged as higher in honesty and naivety than those with more mature faces (McArthur & Apatow, 1984; Berry & McArthur, 1985; McArthur & Berry, 1987; Zebrowitz & Montepare, 1990). Zebrowitz and Montepare (1992) studied baby-faced individuals across the life span and found that overgeneralizations are made at each age range about the baby-faced having more childlike traits, such as in social autonomy, physical weakness, and intellect, than mature faced peers independent of attractiveness. Results also indicate that attractiveness did not have an independent main effect but babyfaced women and men were perceived as more warm and honest than less attractive babyfaced people. When babyfaced women are less attractive, the babyface stereotype of being sincere was not supported (Berry, 1991). However, there is conflicting evidence of a babyfaced stereotype and attractiveness interaction. The effect of stereotyped perceptions of babyfaces was low for all three levels of attractiveness in young adult males and females compared to less babyfaced peers (Berry, 1991). Babyfaced-ness was not significantly correlated with attractiveness in young or older adults in the Zebrowitz and Franklin (2014) study. The problem might be because babyfaces have been perceived as less intelligent while mature faces are associated with higher intelligence. More socially dependent personality traits are attributed with babyfaced-ness which departs from the independent stereotypes of attractiveness and intelligence. Another obvious clue that can serve as Halo and Horns Effects initiators are facial expressions.

**Facial Expressions**

Ecological theory suggests that perceiving and responding to an emotion inferred from a particular expression has developed out of adaptive necessity, such as to quickly
avoid an angry person (Zebrowitz & Montepare, 2006). Based on a perceived facial display of emotion, a global personality trait evaluation is made during social interactions that shape how perceivers engage with the perceived (Back & Nestler, 2016). For example, in studies by Marsh, Ambady, and Kleck (2005a) and Seidel, Habel, Kirschner, Gur, and Derntl (2010), when people display positive (happy) emotions, they are approached more often than those showing negative (angry) emotions. People are perceived not only as more attractive when they display a happier facial expression than a neutral one (Reis, Wilson, Monestere, Bernstein, Clark, & Seidl, et al., 1990), but they are also treated more positively (Langlois et al., 2000) and are judged as having positive personality attributes overall (Nisbett & Wilson, 1997). Evidence suggests that these personality judgments are more accurate for emotional extremes (happy or sad facial expressions) compared to neutral facial expressions that are attributed a range of emotions due to the ambiguity of the expression (Malatesta et al., 1987).

Previous research has found evidence of a relationship between expressivity and perceived attractiveness because certain expressions, like attractiveness, may truly reflect phenotypic quality, health, and mate value (Buss & Barnes, 1986; Buss & Schmitt, 1993; Thornhill & Gangestad, 1993, 1999). First impressions of strangers and resulting behavior based on facial expressions is well documented in the social sciences (Ekman, 1992; Ekman & Friesen, 1969; Thorndike, 1920). As indicated above, certain facial expressions may improve or hinder how others perceive your attractiveness and your overall personality (Thorndike, 1920; Nisbett & Wilson, 1977; Rennels & Kayl, 2015; Golle, Mast, & Lobmaier, 2014). By extension, a person’s emotional expression, in addition to the level of facial attractiveness, greatly influences how others perceive them.
which affects the amount of help, attention, rewards, and cooperation they receive from others (Langlois, Kalankanis, Rubenstein, Larson, Hallam, & Smoot, 2000).

**Smiling.** Some people are born more physically attractive, but the average person can appear more attractive just by smiling. Hall, Schmidt Mast, and West (2016) found that smiling individuals are judged as more attractive and trustworthy than individuals not smiling. The results of Xu et al. (2012) further supports the association between smiling, increased attractiveness, and increased trustworthiness by measuring across cultures. Despite cultural differences, participants from China also rated highly attractive individuals as more trustworthy (Xu et al., 2012). In a similar study, Chinese participants rated smiling faces as having more “face value” and having multiple positive personality traits. The effect of smiling faces and increased attractiveness was more evident for male faces (Lau, 1982). A study from Brazil investigated whether a closed smile, upper smile, broad smile, or no smile had an effect on personality perception of male and female pictures that ranged in age from young, middle-age, to old. Smiling had an overall effect on improving ratings of attractiveness and kindness. As the degree of smiling increased to a broad smile, individuals in the pictures were rated as happier (Otta, Folladore, Abrosio, & Hoshino, 1996). Different types of smiles make a difference in the attribution of personality traits such as Duchenne smiles (real smiles that involves facial muscles around the eyes) compared to non-Duchenne smiles (Mehu, Little, & Dunbar, 2007). The type of smile impacted ratings of extroversion and generosity, but the differences for generosity was seen mostly in males. Another facial expression that has shown to influence trait inference is scowling.

**Scowling.** There are significant differences in personality traits attributed to
scowling (angry) facial expressions in comparison to other facial expressions. Using the Big Five Personality traits, angry faces (computer generated male faces) were rated highest on extraversion. The lowest rated traits were conscientiousness, neuroticism, openness, and agreeableness in that order (Tidball, Prabhala, & Gallimore, 2006). Angry facial expressions have also been associated with high dominance and low affiliation (Hess, Blairy, & Kleck, 2000; Knutson, 1996; Montepare & Dobish, 2003). The prominent facial feature portraying anger, lowered eyebrows, elicits impressions of dominance particularly in Western cultures (Keating, Mazur, & Segall, 1981). Angry faces also convey information about potential behaviors that include a tendency to attack with a domineering, hostile, and unfriendly manner (Secord, 1958). Marsh et al. (2005a) proposed that angry faces may have evolved to elicit reactions that powerful, mature-faced adults can command. Faces expressing anger were perceived as more mature than faces expressing fear. Angry faces were rated higher on the mature personality traits of independence, strength, dominance, masculinity, coldness, and shrewdness. Participants rated fearful faces higher on personality traits associated with babyfaced-ness such as, dependence, weakness, submissiveness, femininity, warmth, naïveté, honesty, and youthful. When people display angry expressions, they are perceived as more powerful, having higher status, and a higher salary (Tiedens, 2001).

**Frowning.** Frowning (sad) facial expressions that were computer generated have been associated with low extraversion, agreeableness, and openness, and ratings were higher on conscientiousness and neuroticism for the sad facial expressions (Tidball et al., 2006). Somewhat contradictory evidence was found in the study by Biel et al. (2012). Sad facial expressions correlated low to moderately with extraversion out of the Big Five
factors. The remaining four factors either negatively correlated very weakly or did not correlate at all with the sad facial expression. In addition, sad faces have been associated with low dominance and moderate affiliation (Hess, Blairy, & Kleck, 2000; Knutson, 1996; Montepare & Dobish, 2003).

Sad facial expressions might be associated with low dominance and moderate affiliation because the expression represents distress cues that trigger an evolved inability to exhibit aggressive behaviors, according to the violence inhibition mechanism (VIM; Blair, 2001; Blair et al., 1997) or a concern mechanism (Nichols, 2001). A distress cue (sad or fearful) displayed by the individual infers emotional distress and relates submission of the expresser instead of aggression. The emotions elicited by the distress cues might be an important part of moral socialization (Blair, 2001). However, contradictory of an aversive based reaction, there is evidence of the distress cues not causing primarily aversive emotional responses (Hess, Blairy, & Kleck, 2000; Marsh, Ambady, & Kleck, 2005b). The same distress cues from sad faces resulted in automatically approaching the sad faces initially, but conscious withdrawal subsequently (Seidel, Habel, Kirschner, Gur, & Derntl, 2010). This response is believed to be caused by previous social experiences that resulted in avoidance.

**Culture and Emotion Interpretation**

Social identity theory created three main theories that attempt to explain cultural differences in emotion interpretation. Social identity theory was one of the original theories created by Tajfel (1972) on the emotional significance and knowledge of social group belonging. From this original theory, identity theories bloomed, creating various new views on group-culture identity. One of those theories, absolutist theory, emphasizes
that basic human nature explains the motivation, actions, or characteristics of all people while cultural differences are ignored (Adamopoulos & Lonner, 1994). Although this approach was popular with early psychologists, the term “absolutism” was not coined until 1992 by Berry, Poortinga, Segall, and Dasen.

The second theory, relational identity theory defines similarities between the self cultural identity of the perceived and perceiver in a group interaction context (Burke, 2006). Studies have shown support for relational identity theory (Elfenbein & Ambady, 2002b) that includes a meta-analysis of cross-cultural studies showing a cultural in-group advantage to emotion recognition (Elfenbein & Ambady, 2002a, 2002b; Mastumoto, 2002). Mastumoto (1989, 1992a) and Schimmack (1996) have presented evidence supporting relational identity theory. They argue that accuracy falls for collectivist cultures when interpreting and expressing negative emotion because such emotions are thought to be more culturally specific. Particularly in Asian cultures, displays of negative emotions are considered disrupting in social situations. However, Lonner (1981) believes that various phenomena measured across cultures manifests differently depending on cultural constraints and requirements.

Universalist theory takes a moderate stance that incorporates ideas from the other two theories. Universalism proposes that there are broad commonalities in human nature but also cultural differences (Adamopoulos & Lonner, 1994). Schwartz (2007) indicated that universalism, in the context of moral inclusiveness across countries, can be differentiated by those who are accepting of all cultures despite differences and those who recognize cultural similarities but choose to value their in-group and reject the out-group because of differences. Countries that were overall more universally inclusive
based on morals, value egalitarianism, and do not value embeddedness (restraint on social behaviors that disrupt group cohesiveness). Inclusive countries were more democratic, religiously heterogeneous, Western European, countries that have ruled their territory over 150 years, and were ex-communist countries. Cultures can possibly influence moral inclusiveness universally as well as the universality of certain emotions.

When comparing the universality of emotions across various cultures (U.S., India, China, Argentina, and Japan), results showed that perceiving emotions accurately is more universal in the domain of emotional intelligence which consists of emotional perception, emotion regulation, and emotion understanding. Emotion regulation (managing emotions) and emotion understanding (understanding emotions, emotional language, and the signals conveyed by emotions) were culturally specific (Shao, Doucet, & Caruso, 2015). Triandis and Bhawuk (1997) found that Indian participants had higher agreement on emotion perception, emotion understanding, and emotion regulation than participants from the other countries. Because India is considered a vertical collectivist culture, accuracy in interpreting negative emotions from facial expression is expected to be lower than their accuracy in interpreting emotions from smiling faces (Triandis & Bhawuk, 1997). Elfenbein and Ambady (2002a) compared American, Indian, and Japanese response bias in emotion recognition of pictures representing seven emotions (happy, sad, angry, surprise, fear, neutral, and disgust) from each culture. Accuracy on recognizing emotions overall was higher for Americans than Indians, and Indians were more accurate than Japanese. The pictures of American facial expressions had higher accuracy ratings of emotion recognition for all participants than pictures of Indian facial expressions and Japanese had the lowest emotion accuracy. The happy and neutral facial expressions were
recognized with the highest accuracy and fear and anger had the lowest recognition accuracy across cultures. As hypothesized, there was a significant in-group advantage in emotion recognition of faces from the same culture. Contrary to their hypothesis, however, participants rated out-group pictures of facial expressions with more positive personality traits than expected, this result was especially significant with pictures of Japanese faces. Aside from problems interpreting and expressing negative emotions, there may be cultural differences in regulating and expressing positive emotions for East Asians (Hui, Fok, & Bond, 2009). East Asians were found to regulate their expressions of positive emotions by considering both positive and negative aspects of expression which prevents jealousy and maintains social relationships (Hui, Fok, & Bond, 2009; Mesquita & Albert, 2007).

**Hypotheses**

This study compared the three researched initiators of “Halo” and “Horns” effects – perceived attractiveness, perceived babyfaced/mature faced, and the facial expressions of smiling, scowling, and frowning. This comparison was made while also examining the reactions of participants from two countries, India and the United States, to the expressions of young female and male Caucasian models.

This study is based on previous research by Radeke and Stahelski (2015). In their study, participants significantly identified the correct emotion to the appropriate facial expression, with the highest accuracy occurring in the smiling-happiness association, while the scowling-angry association had the least accuracy. Accuracy was determined by calculating the mean of the answer choices for each question based on ordinal Likert scales. The hypothesized personality traits were significantly attributed to both female
and male facial expressions of smiling, frowning, and scowling. Smiling faces were associated with the following characteristics and traits: happiness, attractiveness, pleasing to look at, good, not threatening, positive, agreeable, conscientious, extroverted, and open-minded. Frowning faces were judged as: sad, unattractive, not pleasing to look at, good, not threatening, positive, submissive, and calm. Scowling faces were judged as: angry, unattractive, not pleasing to look at, bad, threatening, negative, dominant, excitable, disagreeable, unconscientious, and close-minded. Based on these results and using the same dependent variables, the majority of participants were hypothesized to significantly (accurately) connect smiling to happiness, scowling to anger, and frowning to sadness, with the highest significance (accuracy) occurring for the smiling face.

Secondly, facial expressions were hypothesized to show significant differences in personality trait attribution across all four questions. For the smiling faces, participants are expected to attribute the following characteristics: attractiveness, pleasing to look at, good, not threatening, positive, agreeable, conscientious, extroverted, and open-minded. Scowling face attributions are hypothesized to be unattractive, not pleasing to look at, bad, threatening, negative, dominant, excitable, disagreeable, unconscientious, and close-minded. For frowning faces, participants will attribute unattractive, not pleasing to look at, good, not threatening, positive, submissive, and calm.

Third, Indian participants were hypothesized to show significantly lower mean answer choices (accuracy) for the negative facial expressions across all four questions compared to Americans.

The fourth hypothesis was that Americans will show significantly higher mean accuracy in attributing the predetermined (correct) emotion and personality traits to the
appropriate (accurate) facial expressions than the Indian sample, due to the use of Caucasian faces for the three facial expressions.
CHAPTER III

METHODS

Research Design and Overview

The study is a 2 (gender) x 3 (facial expression) x 2 (culture) mixed design. The first independent variable, gender, a within-subjects variable, consisted of photographs of either young female or male faces in their early twenties. The second independent variable, facial expression, also a within-subjects variable, presents either a smiling, scowling, or frowning face to participants. The third independent variable, culture, a between-subjects variable, compared differences in how American and Indian participants interpret facial expressions. There are four dependent variables consisting of the four questions specified below that were asked after each of the six pictures were presented. Table 1 specifies the dependent variables.

Participants

There were 1,097 primarily white U.S. female and male participants around 18-65 years old from a large variety of careers and educational backgrounds were recruited as the first group of participants using Amazon.com’s Mechanical Turk (MTurk) online survey platform. Participants were required to be 18 years and older and from the United States to take part in the survey which is ensured by clicking that they agree to the terms and conditions before they can begin the survey. Compensation for participating was $0.50.

For the second group, 892 Asian Indian female and male participants around 18-65 years old from various careers and education levels were recruited using the MTurk survey platform. Although English is probably not the primary language for most
Table 1

The Four Questions Presented for Each of the Six Pictures and the Hypothesized Response Choices for Each Facial Expression.

| The Question                        | Expected Response Groupings                      |
|-------------------------------------|--------------------------------------------------|
|                                     | Smiling (1)                                      |
|                                     | Frowning (2)                                     |
|                                     | Scowling (3)                                     |
| Question 1: Expression              | Happiness (1)                                    |
|                                     | Sadness (3)                                      |
|                                     | Anger (6)                                        |
| Question 2: SAM Temperament         | Positive, Neither Dominant Nor Submissive, Neither Calm Nor Excitable (1) |
| Dimensions                          | Negative, Submissive, Calm (2)                   |
|                                     | Negative, Dominant, Excitable (3)                |
| Question 3: Attractiveness,         | Pleasing To Look At, Attractive, Not Threatening, Good (1) |
| Pleasingness, & Threat              | Not Pleasing To Look At, Unattractive, Not Threatening, Bad (2) |
|                                     | Not Pleasing To Look At, Not Attractive, Not Threatening, Bad (3) |
| Question 4: Big Five Personality    | Extroverted, Conscientious, Emotionally Stable, Open-Minded (1) |
| Traits                              | Introverted, Conscientious, Emotionally Stable (2) |
|                                     | Disagreeable, Unconscientious, Not Emotionally Stable, Close-Minded (3) |

participants, English is the second official language of India according India’s Ministry of Law and Justice (Part XVII, Chapter I.— Official Language of The Union). This is important because participants have to be able to read English in order to accept the terms and conditions and take the survey. Participants were required to be 18 years of age or older and from the geographic location of India to participate. After completing the survey, participants were compensated $0.50.
Materials

**Dependent variables.** The purpose of this study intends to partially replicate significant findings of trait grouping from a previous study by Radeke and Stahelski (2015). In that study, the results showed a prominent pattern of personality trait grouping based on facial expression (smiling, frowning, and scowling) that were utilized to create the questions and answer choices for the survey in this study. The emotion expression ratings showed that the smiling facial expressions (open and closed mouth smiling) were rated significantly as happy, the scowling facial expression was rated significantly as angry, and the frowning facial expression was rated moderately as sad. The results of the Self-Assessment Manikin (SAM) question showed that the closed mouth happy facial expression was rated as slightly positive, slightly more dominant than subordinate, and calm. The angry facial expression was rated as negative, dominant, and somewhat more calm than excited. The sad facial expression was rated as negative, the middle between subordinate and dominant, and calm. The open mouth smiling facial expression was rated as highly positive, slightly more dominant, and excited. On the mini-marker question, the closed mouth smiling facial expression was rated as extroverted, agreeable, conscientious, emotionally stable, and open. In comparison, the angry facial expression was rated as slightly more introverted, disagreeable, unconscientious, emotionally unstable, and slightly more closed. The sad facial expression was rated as more introverted, agreeable, conscientious, slightly more emotionally stable, and open. The open mouth smiling facial expression was rated as extroverted, agreeable, conscientious, slightly more emotionally stable, and open.
As shown in Table 1 for this study, the first question asks, “as quickly as possible, please choose ONE emotion that best describes the emotion of the individual in the photograph.” There were six answer choices to select from (angry, sad, happy, surprise, fearful, and disgust. The smiling facial expressions was expected to be associated with happiness, the scowling facial expression was expected to be associated with anger, and the frowning facial expression was expected to be associated with sadness.

The second question, “which of the three following groups of personality traits is the BEST fit for the picture above?” assessed the three Self-Assessment Manikin personality dimensions (excited-calm, subordinate-dominant, and positive-negative). There were three answer choices and each choice grouped about five personality traits based on previous results from the Radeke and Stahelski (2015) study. For the SAM question, the smiling facial expression was expected to be perceived as positive, neither dominant nor submissive, neither calm nor excitable. The scowling facial expression should be associated with the personality traits: negative, dominant, and excitable. The frowning facial expression was expected to be perceived as negative, submissive, and calm (Bradley & Lang, 1994).

The third question, “which of the three following groups of personality traits is the BEST fit for the picture above?” assessed perceived attractiveness, pleasantness, threat, and honesty. Similar to the second question, three answer choices with grouped personality traits were created based on results previously mentioned. Participants were expected to perceive the smiling facial as pleasing to look at, attractive, not threatening, and good. While the scowling facial was expected to be associated with: not pleasing to
look at, not attractive, threatening, and bad. The frowning facial expression was expected to be associated with: not pleasing to look at, unattractive, not threatening, and bad.

The fourth question, “which of the three following groups of personality traits is the BEST fit for the picture above?” measured the Big-Five personality traits (agreeableness, openness, conscientiousness, extraversion, and neuroticism) (Goldberg, 1992). Like question two and three, there were three answer choices with grouped personality traits that reflect previous results from the same study. Based on the Big-Five, the smiling facial expression was expected to be perceived as extroverted, conscientious, emotionally stable, and open-minded. The scowling facial expression should be associated with: disagreeable, unconscientious, not emotionally stable, and close-minded. The frowning facial expression was expected to be associated with: introverted, conscientious, and emotionally stable.

**Emotion.** In the first question, participants were asked to view one of the six facial expressions that were randomly presented and answered a brief manipulation check question. The emotion question was to assess what emotion the individual in the picture is facially displaying (anger, sadness, happiness, fear, disgust, and surprise) as perceived by the participant. Based on Ekman’s work pertaining to the six universally interpreted facial expressions, the emotion question attempts to measure cross-cultural similarities or differences in the perception of the six expressions (Ekman, 1999). The emotion question was also asked to see if certain emotions are associated with certain specific groupings of the traits and perceptions listed above.

**Self-assessment manikin (SAM).** The second question assessed the three SAM dimensions of excited-calm, subordinate-dominant, and positive-negative. The Self-
Assessment Manikin was created by Bradley and Lang (1994) to assess the three affective temperament dimensions of pleasure (positive-negative), arousal (excited-calm), and dominance (dominant-submissive) ranging from positive to negative associations. Each dimension was measured using a 9-point Likert scale as shown in Appendix A. The points along the SAM Likert scale are represented as human shaped figures. Pleasure (positiveness) is measured by a Likert scale ranging from a smiling and happy figure to a frowning and unhappy figure. Arousal is measured using a Likert scale ranging from a human shaped figure showing an excited and wide-eyed expression to a relaxed and sleepy expression. Dominance is measured by the size of the SAM human shaped figure that ranges from a dominant large sized figure to a submissive small sized figure. The full SAM scale was not be used in this study but instead, the study used a condensed set of the SAM adjectives that were significantly associated with happy, sad, and angry facial expressions from the Radeke and Stahelski (2015) study as indicated in Table 1.

**Mini-markers (MM).** The third question measures the perception of personality traits. It is based on a condensed subset of 40 validated adjectives assessing the Big-Five personality traits, called the Mini-Markers (MM; Saucier, 1994). The original set of 100 personality adjective markers was created by Goldberg (1992) to assess the Big-Five personality factor structure (agreeableness, conscientiousness, emotional stability, extroversion, and openness). Saucier tested the performance of the 100 adjective markers in 12 sets of data in order to create a validated subset of 40 adjectives that would be simpler and easier to use for certain assessment conditions. As shown in Appendix B, there are eight adjectives representing each of the five factors for the 40 adjective markers. Table 1 shows how the adjective markers that showed significant associations
with each of the three facial expressions (happy, sad, and angry) in the Radeke and Stahelski study (2015) were used to create the answer choices for the fourth question in the survey for this study.

**Other traits and perceptions.** The fourth question pertains to perceived attractiveness, pleasingness, threat, and honesty. This question contains multiple components that begins with asking if the individual in the picture is not pleasing or pleasing to look. Then participants made a choice about whether that individual comes across as attractive or not attractive to them. Next, participants were asked if the individual appears threatening or not threatening to them. The last question determines if the participants perceived the individual in the picture seems good or bad. The components of this question were based on previous research about the relationship between facial expressions and how we assess the entirety of someone’s personality, attractiveness, and how pleasing, threatening, and honest they appear (Dion et al., 1972; Nisbett & Wilson, 1977; Rennels & Kayl, 2015; Back & Nestler, 2016).

**Qualtrics and Amazon Mechanical Turk.** The survey was created in the survey platform using Central Washington University’s (CWU) subscription to Qualtrics, which is a popular and validated survey platform used in the social sciences for research purposes. A web link to the survey created in Qualtrics was provided in the MTurk platform. According to Amazon.com, MTurk was created to allow businesses to make use of a scalable, diverse, and readily available workforce to perform human intelligence tasks “such as identifying objects in a photo or video, performing data de-regulation, transcribing audio recordings, or researching data details” (Amazon Mechanical Turk). The tasks would otherwise require hiring a large and expensive temporary workforce or
would have gone undone. Employees can also complete these tasks when it is convenient and are rewarded for each one they complete.

Regarding the social sciences, MTurk is an online survey platform that allows for cheaper and immediate participant compensation while targeting a more representative population who are members of Amazon.com. The use of MTurk in social sciences assures that the range of participants from various economic, social, educational, age, gender, and sexual orientation backgrounds is significantly greater than what is available in typical American college and university student pools. According to Berinsky, Huber, and Lenz (2012) MTurk is an inexpensive and convenient tool for recruiting participants from diverse subject pools. Despite concerns over the validity and reliability of MTurk, Berinsky et al. (2012) found MTurk participants to be more representative of the population, inexpensive to recruit, and more consistently responsive to stimuli. They are not an overused pool, and habitual responding was a minor concern. In addition, the sample age range is expected to be notably broader, based on the experiences of Berinksy et al. (2012) and Buhrmester, Kwang, and Gosling (2011).

**Pictures.** The facial photographs consisted of three young white female and three young white male faces featuring only the shoulders and head of the individuals. The ages of the individuals in the photographs range from 19 to 31 years old. There was one female and one male picture expressing each of the three facial expressions (angry, happy, and sad). The pictures were taken from the FACES collections of the Max Planck Institute for Human Development, Center for Lifespan Psychology, Berlin, Germany (Ebner, Riediger, & Lindenberger, 2009). The photographs are shown in Appendix C.
Pictures of individuals with an average age of 24.3 years from the FACES collection of the Max Planck Institute for Human Development were used by permission.

Procedure

At least five pilot volunteers were asked to take the survey to calculate the average time it takes to complete the survey. The average time was predicted to be about 12 minutes. Participants who spend more than 30 minutes to complete the survey were excluded from the study because they are most likely not following the instructions that ask participants to answer the four questions for each of the six pictures as quickly as possible. In addition, if the same IP address on MTurk appears more than once, the user ID was checked to determine if the same user has taken the survey multiple times. All of the surveys that the user has completed except for the first one were deleted if they have taken the survey more than once.

Participants were either American or Indian members of Amazon.com who were interested in taking part in the study. They selected the survey (or HIT) from a list of HITS provided by MTurk. As mentioned, a weblink included in the HIT redirected participants to the actual survey in Qualtrics.

After participants are redirected to the survey in Qualtrics, the first question they encountered is their agreement to the terms and conditions of participating in the study, such as the minimum required age and the specific geographic location (either India or the United States). Participants then answered demographic questions after they agreed to take part in the study. Next, participants were asked to view the first picture presented in random order for 10 seconds and then answer four questions that were presented randomly about that picture as quickly as possible. The same procedure was followed for
the remaining five pictures. Participants were textually debriefed after finishing the survey and paid within the next few days.
CHAPTER IV

RESULTS

Participants’ data were removed if their IP address appeared more than once, if they spent more than 30 minutes responding to the survey, if the country of residence was neither India nor the United States, and if their survey was about less than 65% complete. The main effects to be covered in this section will be facial expression, gender, and culture, in that order. The analysis of facial expression is first introduced to simply break down the large effects of this variable by itself and then the small effects of only gender, second, to better understand the complexity of the cultural effects, which incorporates all three variables.

Each of the answer choices for the four questions used interval scaling from the most positive emotions or personality traits to the most negative. The emotional inference question was the only one that was scaled, from 1 = Happy, 2 = Surprise, 3 = Sad, 4 = Fear, 5 = Disgusted, and 6 = Angry. The emotional scale was formed based on previous literature relating the differences in events (positive–negative) that evoke the six emotions. Beginning with the most positive emotion, happiness was correlated with Duchenne’s smiles when experiencing a pleasant (positive) event or when people were enjoying themselves (Ekman, 1990). Surprise according to Darwin (1872/1989), can be construed as a state of attention that has the potential to graduate into a positive emotion, such as amazement, or shift negative towards fear and terror. Following surprise, the reaction can also morph into sadness that could represent a distress cue triggering a desire to help the expresser (Blair, 2001). However, people expressing sadness have been perceived as likable, warm, and nice (Tiedens, 2001). Although sadness and fear are
closely related, fear might have been adaptive to flee from predators or deal with a distressing event that causes a psychological threat (Ekman, 1999). Disgust was listed before anger because a person displaying disgust is normally a result of something offensive whether it is the smell or taste that causes avoidance of the source (Ekman, 1992). As an example, the regional brain activity of participants in Davidson et al.’s (1990) study reflected a desire to withdraw due to the negative affect of a disgusted facial expression (Ekman, 1999). Considered the most negative facial expression of the six, anger elicits impressions of dominance (Keating, Mazur, & Segall, 1981), the potential of attack as a result of a hostile and unfriendly manner (Secord, 1958), and intimidating others to comply (Clark, Pataki, & Carver, 1996; Tiedens, 2001). The remaining three questions all had three answer choices that scaled from the most positive to negative, according to the emotion the answer was associated with based on previous research (Radeke & Stahelski, 2015), and on the emotion question scale.

**Facial Expression**

Repeated-measures ANOVAs were conducted to solely examine the effects of facial expression across each of the four questions, regardless of culture and gender. A Bonferroni correction was implemented to adjust the α level for each ANOVA to $p = 0.0125$. For each ANOVA, Mauchly’s test was significant, violating the assumption of sphericity, $\chi^2(2) = 648.02, p < .001$, therefore the Huynh-Feldt corrected value is reported for the within-subjects effects of each ANOVA. On the emotion question repeated-measures ANOVA, as shown in Table 2, within-subjects effects using the Huynh-Feldt correction was significant, $F(2, 3109) = 56504.13, p < .001$. The facial expression effect size estimate for the emotion question was very high, $\eta^2_p = 0.97$. Participants correctly
identified the frowning face as “sad” ($M = 3.20$, $SD = 0.40$), the smiling face as “happy” ($M = 1.04$, $SD = 0.26$), and the scowling face as “angry” ($M = 5.65$, $SD = 0.55$).

For the repeated-measures ANOVA on the SAM question, as shown in Table 3, within-subjects effects using the Huynh-Feldt correction was significant $F(2, 3884.9) = 7020$, $p < .001$. The effect size estimate for the SAM question was also high, $\eta_p^2 = 0.78$. Participants generally attributed the correct sad answer choice (negative, submissive, and calm) to the frowning facial expression ($M = 2.04$, $SD = 0.48$), the happy answer choice (positive, neither dominant nor submissive, and neither calm nor excitable) to the smiling facial expression ($M = 1.09$, $SD = 0.29$), and the angry answer choice (negative, dominant, and excitable) to the scowling facial expression ($M = 2.68$, $SD = 0.47$).

The repeated-measures ANOVA for the Social Perceptions questions, as shown in Table 4, was significant for within-subjects effects using the Huynh-Feldt correction, $F(2, 3874.4) = 6386.87$, $p < .001$. The effect size estimate was high, $\eta_p^2 = 0.76$. The correct answers were generally attributed to each facial expression: the sad answer choice (not pleasing to look at, unattractive, not threatening, and bad) was attributed to the frowning facial expression ($M = 2.02$, $SD = 0.54$), the happy answer choice (pleasing to look at, attractive, not threatening, and good) to the smiling facial expression ($M = 1.09$, $SD = 0.28$), and the angry answer choice (not pleasing to look at, not attractive, threatening, and bad) to the scowling facial expression ($M = 2.65$, $SD = 0.47$).

The repeated measures ANOVA for the Big 5 Factors questions, as shown in Table 5, was significant for within-subjects effects using the Huynh-Feldt correction, $F(2, 3975) = 4050.85$, $p < .001$. The effect size estimate was high, $\eta_p^2 = 0.67$. The correct sad answer choice (introverted, conscientious, and emotionally stable) was attributed to the
Table 2

Emotional Inference: Facial Expression ANOVA

| Stimulus Condition | M   | SD  | df       | F         | p     | $\eta^2_p$ |
|--------------------|-----|-----|----------|-----------|-------|-----------|
| Frowning           | 3.20| 0.40| (2, 3109)| 56504.13 | p < .001| 0.97      |
| Smiling            | 1.04| 0.26|          |           |       |           |
| Scowling           | 5.65| 0.55|          |           |       |           |

Mauchly’s test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 648.02$, $p < .001$, therefore the Huynh-Feldt corrected value is reported above for the tests of within-subjects effects. The emotion scale is as follows: Happy (Smiling) = 1; Surprise = 2; Sad (Frowning) = 3; Fear = 4; Disgusted = 5; and Angry (Scowling) = 6.

Table 3

Self-Assessment Manikin Dimensions: Facial Expression ANOVA

| Stimulus Condition | M   | SD  | df       | F         | p     | $\eta^2_p$ |
|--------------------|-----|-----|----------|-----------|-------|-----------|
| Frowning           | 2.04| 0.48| (2, 3885)| 7020.0    | p < .001| 0.78      |
| Smiling            | 1.09| 0.29|          |           |       |           |
| Scowling           | 2.68| 0.47|          |           |       |           |

Mauchly’s test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 49.16$, $p < .001$, therefore the Huynh-Feldt corrected value is reported above for the tests of within-subjects effects. The response scale is as follows: Smiling is Positive, Neither Dominant Nor Submissive, and Neither Calm Nor Excitable = 1; Frowning is Negative, Submissive, and Calm = 2; and Scowling is Negative, Dominant, and Excitable = 3.

Table 4

Social Perceptions: Facial Expression ANOVA

| Stimulus Condition | M   | SD  | df       | F         | p     | $\eta^2_p$ |
|--------------------|-----|-----|----------|-----------|-------|-----------|
| Frowning           | 2.02| 0.54| (2, 3874)| 6386.87   | p < .001| 0.76      |
| Smiling            | 1.09| 0.28|          |           |       |           |
| Scowling           | 2.65| 0.47|          |           |       |           |

Mauchly’s test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 54.83$, $p < .001$, therefore the Huynh-Feldt corrected value is reported above for the tests of within-subjects effects. The response scale is as follows: Smiling is Pleasing To Look At, Attractive, Not Threatening, and Good = 1; Frowning is Not Pleasing To Look At, Unattractive, Not Threatening, and Good = 2; and Scowling is Not Pleasing To Look At, Not Attractive, Threatening, and Bad = 3.
Table 5

The Big 5 Factors: Facial Expression ANOVA

| Stimulus Condition | M    | SD  | Df     | F      | p     | η²_p |
|--------------------|------|-----|--------|--------|-------|------|
| Frowning           | 2.17 | 0.59| (2, 3975) | 4050.85 | p < .001 | 0.67 |
| Smiling            | 1.23 | 0.39|        |        |       |      |
| Scowling           | 2.67 | 0.52|        |        |       |      |

Mauchly’s test indicated that the assumption of sphericity had been violated, χ²(2) = 2.47, p < .001, therefore the Huynh-Feldt corrected value is reported above for the tests of within-subjects effects. The response scale is as follows: Smiling is Extroverted, Conscientious, Emotionally Stable, and Open-Minded = 1; Frowning is Introverted, Conscientious, and Emotionally Stable = 2; and Scowling is Disagreeable, Unconscientious, Emotionally Stable, and Close-Minded = 3.

Frowning facial expression (M = 2.17, SD = 0.59), the correct happy answer choice (extroverted, conscientious, emotionally stable, and open-minded) was attributed to the smiling facial expression (M = 1.23, SD = 0.39), and the correct angry answer choice (disagreeable unconscientious, not emotionally stable, and close-minded) was attributed to the scowling facial expression (M = 2.67, SD = 0.52).

Gender

Four additional ANOVAs were performed to analyze gender separately from culture and facial expression across all four questions. A Bonferroni correction was implemented to adjust the α level for each ANOVA to p = 0.0125. For the emotion question repeated-measures ANOVA, as shown in Table 6, within-subjects effects using the Huynh-Feldt correction was significant, F(1,1986) = 108.3, p < .001. However, the effect size estimate was very small, η²_p = 0.02. The average answer choices between males and female pictures showed little variability and high agreement for the emotion question.
Table 6

Emotional Inference: Gender ANOVA

| Stimulus Condition | M   | SD | Df     | F        | p        | $\eta^2_p$ |
|--------------------|-----|----|--------|----------|----------|-----------|
| Female             | 3.25| 0.34| (1, 1986) | 108.03   | $p < .001$ | 0.05      |
| Male               | 3.34| 0.27|        |          |          |           |

There are only two conditions, therefore the assumption of sphericity is met. The Greenhouse-Geisser test is reported above for the tests of within-subjects effects. The emotion scale is as follows: Happy (Smiling) = 1; Surprise = 2; Sad (Frowning) = 3; Fear = 4; Disgusted = 5; and Angry (Scowling) = 6.

The SAM question repeated-measures ANOVA, noted in Table 7, was significant for within-subjects effects using the Huynh-Feldt correction, $F(1,1988) = 104.37, p < .001$. The effect size estimate was again very small, $\eta^2_p = 0.05$. Male faces compared to female faces showed slightly higher means and, therefore, larger mean differences on the SAM question.

The Social Perceptions question repeated-measures ANOVA, shown in Table 8, showed a significant within-subjects effect using the Huynh-Feldt correction, $F(1,1988) = 122.04, p < .001$. The effect size estimate was very small, $\eta^2_p = 0.06$. There were larger mean answer choice differences, resulting in low agreement for answer choices between male and female faces.

For the repeated-measures ANOVA regarding the Big 5 Factors, as shown in Table 9, there was a significant within-subjects effects using the Huynh-Feldt correction, $F(1,1988) = 31.52, p < .001$. The effect size estimate was very small, $\eta^2_p = 0.06$. Answer choice variability between male and female faces was significantly small, showing the highest amount of agreement on the Big 5 Factors question.
Table 7
Self-Assessment Manikin: Gender ANOVA

| Stimulus Condition | M    | SD   | Df   | F     | p     | η²_p |
|--------------------|------|------|------|-------|-------|------|
| Female             | 1.89 | 0.33 | (1, 1988) | 104.37 | p < .001 | 0.05 |
| Male               | 1.98 | 0.28 |       |       |       |      |

There are only two conditions, therefore the assumption of sphericity is met. The Greenhouse-Geisser test is reported above for the tests of within-subjects effects. The response scale is as follows: Smiling is Positive, Neither Dominant Nor Submissive, and Neither Calm Nor Excitable = 1; Frowning is Negative, Submissive, and Calm = 2; and Scowling is Negative, Dominant, and Excitable = 3.

Table 8
Social Perceptions: Gender ANOVA

| Stimulus Condition | M    | SD   | Df   | F     | p     | η²_p |
|--------------------|------|------|------|-------|-------|------|
| Female             | 1.87 | 0.35 | (1, 1988) | 122.04 | p < .001 | 0.06 |
| Male               | 1.97 | 0.29 |       |       |       |      |

There are only two conditions, therefore the assumption of sphericity is met. The Greenhouse-Geisser test is reported above for the tests of within-subjects effects. The response scale is as follows: Smiling is Pleasing To Look At, Attractive, Not Threatening, and Good = 1; Frowning is Not Pleasing To Look At, Unattractive, Not Threatening, and Good = 2; and Scowling is Not Pleasing To Look At, Not Attractive, Threatening, and Bad = 3.

Table 9
The Big 5 Factors: Gender ANOVA

| Stimulus Condition | M    | SD   | Df   | F     | p     | η²_p |
|--------------------|------|------|------|-------|-------|------|
| Female             | 2.00 | 0.39 | (1, 1988) | 31.52 | p < .001 | 0.02 |
| Male               | 2.05 | 0.34 |       |       |       |      |

There are only two conditions, therefore the assumption of sphericity is met. The Greenhouse-Geisser test is reported above for the tests of within-subjects effects. The response scale is as follows: Smiling is Extroverted, Conscientious, Emotionally Stable, and Open-Minded = 1; Frowning is Introverted, Conscientious, and Emotionally Stable = 2; and Scowling is Disagreeable, Unconscientious, Emotionally Stable, and Close-Minded = 3.
Culture

Four 2 (gender) X 3 (facial expression) X 2 (culture) mixed factorial MANOVAs were conducted in SPSS to analyze differences between each of the four questions (DV’s), based on the independent variables of gender, facial expression, and culture.

A Bonferroni correction was implemented to adjust the $\alpha$ level for each mixed factorial MANOVA to $p = 0.0125$. For each MANOVA, Box’s test of the assumption of equality of covariance matrices was significant ($p < .001$), violating the assumption of homogeneity of variance. Levene’s test of equality of error variances for each of the dependent variables was significant for all four MANOVAs ($p < .05$) violating the assumption that error is equally distributed across groups. More details will be presented in the discussion section.

Emotion. The first mixed factorial MANOVA, noted in Table 10, assessed differences across culture, gender, and facial expression on the emotion question. Using Pillai’s trace, there was a significant effect of culture on the perception of facial expression, $V = 0.07$, $F(6, 1980) = 23.26$, $p < .001$. Separate univariate ANOVAs analyzing the effect of culture on each dependent variable separately found significant cultural, gender, and facial expression effects on the emotion perception of facial expression displayed by a female model in a photograph showing a frowning expression, $F(1, 1985) = 26.55$, $p < .001$, on the emotion perception of a scowling facial expression of a female model in a photograph, $F(1, 1985) = 88.52$, $p < .001$, and perception of a scowling facial expression of a male model in a photograph, $F(1, 1985) = 44.28$, $p < .001$. All other cultural comparisons were non-significant.
Table 10

Emotional Inference MANOVA

| Stimulus Condition | Culture       | M    | SD  | Df         | F     | p       |
|--------------------|---------------|------|-----|------------|-------|---------|
| Smiling Female     | American      | 1.04 | 0.32| (1, 1985)  | 0.51  | p = .447 (NS) |
|                    | Indian        | 1.05 | 0.32|            |       |         |
| Smiling Male       | American      | 1.03 | 0.30| (1, 1985)  | 1.21  | p = .271 (NS) |
|                    | Indian        | 1.05 | 0.32|            |       |         |
| Frowning Female    | American      | 3.09 | 0.36| (1, 1985)  | 26.55 | p < .001 |
|                    | Indian        | 3.19 | 0.55|            |       |         |
| Frowning Male      | American      | 3.24 | 0.55| (1, 1985)  | 3.24  | p = .072 (NS) |
|                    | Indian        | 3.29 | 0.62|            |       |         |
| Scowling Female    | American      | 5.73 | 0.68| (1, 1985)  | 88.52 | p < .001 |
|                    | Indian        | 5.37 | 1.04|            |       |         |
| Scowling Male      | American      | 5.80 | 0.48| (1, 1985)  | 44.28 | p < .001 |
|                    | Indian        | 5.64 | 0.63|            |       |         |

Note: Pillai’s Trace for MANOVA was significant for culture \(V = 0.07, F(6, 1980) = 23.26, p < .001\). The emotion scale is as follows: Happy (Smiling) = 1; Surprise = 2; Sad (Frowning) = 3; Fear = 4; Disgusted = 5; and Angry (Scowling) = 6.

Pairwise comparisons for the main effect of culture on frowning using a Bonferroni adjustment showed that American participants were slightly more accurate \(M = 3.09, SD = 0.36\) than Indian \(M = 3.19, SD = 0.55\) participants, but both correctly attributed sadness emotion to the frowning female facial expression. There was a non-significant difference on the perception of the frowning male expression between American \(M = 3.25, SD = 0.55\) and Indian \(M = 3.29, SD = 0.62\) participants because
both groups accurately identified the expression as sad. American participants were significantly more accurate in attributing the correct angry emotion to the scowling female expression ($M = 5.73, SD = 0.68$) while the Indian participants inaccurately attributed disgust ($M = 5.37, SD = 1.04$). A significant difference was found between American and Indian participants in the perception of the scowling male facial expression; but American ($M = 5.80, SD = 0.48$) and Indian ($M = 5.64, SD = 0.63$) participants both accurately attributed anger to the scowling male expression. The difference between American ($M = 1.04, SD = 0.32$) and Indian ($M = 1.05, SD = 0.32$) participants on the perception of the smiling female facial expression was non-significant; both groups accurately saw the smiling facial expression as happy. The smiling male facial expression difference was non-significant, as American ($M = 1.03, SD = 0.30$) and Indian ($M = 1.05, SD = 0.32$) participants accurately identified the facial expression as happy.

**SAM dimensions.** The results of the second mixed factorial MANOVA, found in Table 11, compared differences between American and Indian participants on the perception of temperament traits based on the three SAM dimensions. Using Pillai’s trace, there was a significant effect of culture on the SAM dimensions, $V = 0.10, F(6, 1982) = 34.87, p < .001$. Separate univariate ANOVAs assessing cultural differences across each of the separate dependent variables showed significant effects of culture, gender, and facial expression on the perception of SAM dimensions for the frowning female facial expression, $F(1, 1987) = 4.80, p = .029$; the smiling female facial expression, $F(1, 1987) = 22.60, p = .029$; the smiling male facial expression, $F(1, 1987) = 12.50, p < .001$; the scowling female facial expression, $F(1, 1987) = 123.46, p < .001$;
Table 11

Self-Assessment Manikin Dimensions MANOVA

| Stimulus Condition | Culture      | M     | SD  | Df    | F     | p     |
|--------------------|--------------|-------|-----|-------|-------|-------|
| Smiling Female     | American n = 1097 | 1.04  | 0.26| (1, 1987) | 22.60 | p = .029 |
|                    | Indian n = 892   | 1.12  | 0.43|       |       |       |
| Smiling Male       | American n = 1097 | 1.07  | 0.33| (1, 1987) | 12.50 | p < .001 |
|                    | Indian n = 892   | 1.13  | 0.44|       |       |       |
| Frowning Female    | American n = 1097 | 2.07  | 0.57| (1, 1987) | 4.80  | p = .029 |
|                    | Indian n = 892   | 2.01  | 0.66|       |       |       |
| Frowning Male      | American n = 1097 | 2.03  | 0.54| (1, 1987) | 0.29  | p = .591 (NS) |
|                    | Indian n = 892   | 2.04  | 0.63|       |       |       |
| Scowling Female    | American n = 1097 | 2.70  | 0.56| (1, 1987) | 123.46| p < .001 |
|                    | Indian n = 892   | 2.37  | 0.77|       |       |       |
| Scowling Male      | American n = 1097 | 2.91  | 0.34| (1, 1987) | 119.31| p < .001 |
|                    | Indian n = 892   | 2.67  | 0.62|       |       |       |

Note: Pillai’s Trace for MANOVA was significant for culture ($V = 0.10, F(6, 1982) = 34.87, p < .001$). The response scale is as follows: Smiling is Positive, Neither Dominant Nor Submissive, and Neither Calm Nor Excitable = 1; Frowning is Negative, Submissive, and Calm = 2; and Scowling is Negative, Dominant, and Excitable = 3.

and the scowling male facial expression, $F(1, 1987) = 119.31, p < .001$. The perception of SAM dimensions for the frowning male facial expression was non-significant.

Comparing main effects using a Bonferroni adjustment revealed significant mean differences between American and Indian participants on the SAM dimensions for almost all facial expressions except for the non-significant comparison of Americans ($M = 2.03$,
SD = 0.54) and Indians (M = 2.04, SD = 0.63) on the frowning male facial expression. However, both groups correctly identified the frowning male facial expression as negative, submissive, and calm. Although a significant difference between cultures was found regarding the frowning female facial expression, American (M = 2.07, SD = 0.57) and Indian (M = 2.01, SD = 0.66) both accurately made the negative, submissive, and calm attributions. American participants were only slightly more accurate (M = 1.04, SD = 0.26) than Indian (M = 1.12, SD = 0.43) participants in attributing the correct dimensions, positive, neither dominant nor submissive, and neither calm nor excitable to the smiling female facial expression. American (M = 1.07, SD = 0.33) and Indian (M = 1.13, SD = 0.44) participants correctly attributed the same dimensions to the smiling male facial expression. Americans were more accurate (M = 2.70, SD = 0.56) in attributing negativity, dominance, and excitability to the scowling female facial expression compared to the Indian participants who incorrectly attributed, negativity, submissiveness, and calmness (M = 2.37, SD = 0.77). Even though there was a significant mean difference between the two groups, both Americans (M = 2.91, SD = 0.34) and Indians (M = 2.67, SD = 0.62) attributed the correct dimensions, negative, dominant, and excitable the scowling male facial expression.

Social perceptions. The third mixed factorial MANOVA, noted in Table 12, analyzed differences in perceived attractiveness, pleasingness, threat, and good/bad across American and Indian participants. Using Phillai’s trace, there was a significant effect of culture on these variables, V = 0.09, F(6, 1982) = 31.83, p < .001. Separate univariate ANOVAs assessing the effects of culture on each dependent variable separately revealed significant cultural, gender, and facial expression effects on perceived
Table 12

Social Perceptions MANOVA

| Stimulus Condition | Culture   |   |   |   |   |
|--------------------|-----------|---|---|---|---|
|                    |           | M | SD | Df | F  | p  |
| Smiling Female     | American  | 1.05 | 0.27 | (1, 1987) | 15.63 | p < .001 |
|                    | n = 1097  |   |   |   |   |   |
|                    | Indian    | 1.11 | 0.40 |   |   |   |
|                    | n = 892   |   |   |   |   |   |
| Smiling Male       | American  | 1.07 | 0.30 | (1, 1987) | 12.46 | p < .001 |
|                    | N = 1097  |   |   |   |   |   |
|                    | Indian    | 1.13 | 0.43 |   |   |   |
|                    | n = 892   |   |   |   |   |   |
| Frowning Female    | American  | 2.00 | 0.59 | (1, 1987) | 0.67  | p = .408 (NS) |
|                    | n = 1097  |   |   |   |   |   |
|                    | Indian    | 2.02 | 0.74 |   |   |   |
|                    | n = 892   |   |   |   |   |   |
| Frowning Male      | American  | 1.99 | 0.59 | (1, 1987) | 9.30  | p = .002 |
|                    | n = 1097  |   |   |   |   |   |
|                    | Indian    | 2.08 | 0.71 |   |   |   |
|                    | n = 892   |   |   |   |   |   |
| Scowling Female    | American  | 2.66 | 0.57 | (1, 1987) | 95.57 | p < .001 |
|                    | n = 1097  |   |   |   |   |   |
|                    | Indian    | 2.37 | 0.74 |   |   |   |
|                    | n = 892   |   |   |   |   |   |
| Scowling Male      | American  | 2.87 | 0.38 | (1, 1987) | 110.82 | p < .001 |
|                    | n = 1097  |   |   |   |   |   |
|                    | Indian    | 2.64 | 0.60 |   |   |   |
|                    | n = 892   |   |   |   |   |   |

Note: Pillai’s Trace for MANOVA was significant for culture ($V = 0.09, F(6, 1982) = 31.83, p < .001$). The response is as follows: Smiling is Pleasing To Look At, Attractive, Not Threatening, and Good = 1; Frowning is Not Pleasing To Look At, Unattractive, Not Threatening, and Good = 2; and Scowling is Not Pleasing To Look At, Not Attractive, Threatening, and Bad = 3.

Social perceptions of the frowning male facial expression, $F(1, 1987) = 9.30, p = .002$, the smiling female facial expression, $F(1, 1987) = 15.36, p < .001$, the smiling male facial expression, $F(1, 1987) = 12.46, p < .001$, the scowling female facial expression, $F(1, 1987) = 95.57, p < .001$, and the scowling male facial expression, $F(1, 1987) = 110.82, p$
The remaining frowning female expression showed non-significant effects of culture.

Pairwise comparisons of the main effect of culture using a Bonferroni adjustment showed only non-significant mean differences on American and Indian responses for all social perceptions for both smiling faces. Both American ($M = 1.05, SD = 0.27$) and Indian ($M = 1.11, SD = 0.49$) participants attributed the ‘correct’ social perceptions: pleasing to look at, attractive, not threatening, and good to the smiling female facial expression. Americans ($M = 1.07, SD = 0.30$) and Indians ($M = 1.13, SD = 0.43$) additionally attributed the same correct social perceptions to the smiling male facial expression.

Significant cultural effects were found where American ($M = 2.00, SD = 0.59$) and Indian ($M = 2.02, SD = 0.74$) participants correctly identified the frowning female facial expression as not pleasing to look at, unattractive, not threatening, and good. Americans were significantly more accurate ($M = 1.99, SD = 0.59$) than Indian ($M = 2.08, SD = 0.71$) participants in attributing the correct social perceptions to the frowning male facial expression.

Americans were significantly more accurate ($M = 2.66, SD = 0.57$), attributing the correct social perceptions (not pleasing to look at, not attractive, threatening, and bad) to the scowling female facial expression compared to the Indians ($M = 2.37, SD = 0.74$) who somewhat attributed incorrect social perceptions (not pleasing to look at, unattractive, not threatening, and good) to the same facial expression. Although there was a significant mean difference of culture for the scowling male facial expression, both
American \( (M = 2.87, \text{SD} = 0.38) \) and Indian \( (M = 2.64, \text{SD} = 0.60) \) participants attributed the correct social perceptions.

**The big five.** The results of the fourth mixed factorial MANOVA, noted in Table 13, assessed cultural differences of perceived personality traits based on the Big Five personality factors. Using Phillai’s trace, there was a significant effect of culture on the Big Five factors, \( V = 0.16, F(6, 1982) = 64.53, p < .001 \). Separate univariate ANOVAs analyzing cultural differences across each of the variables separately revealed significant effects of culture, gender, and facial expression on the perceived personality traits of the smiling female facial expression, \( F(1, 1987) = 124.22, p < .001 \), the smiling male facial expression, \( F(1, 1987) = 141.89, p < .001 \), the scowling female facial expression, \( F(1, 1987) = 172.08, p < .001 \), and the scowling male facial expression, \( F(1, 1987) = 117.81, p < .001 \). The remaining sad facial expressions were non-significant.

Further pairwise comparisons on the main effect of culture corrected using a Bonferroni adjustment found significant mean differences between American and Indian participants for all dependent variables. Americans \( (M = 2.17, \text{SD} = 0.68) \) and Indians \( (M = 2.15, \text{SD} = 0.82) \) both attributed the same incorrect personality traits, (extroverted, conscientious, emotionally stable, and open-minded) to the frowning female facial expression even though mean differences were significant. The American participants were slightly more accurate \( (M = 2.16, \text{SD} = 0.66) \) than Indian \( (M = 2.19, \text{SD} = 0.79) \) participants in attributing the correct personality traits to the frowning male facial expression, but both groups attributed the correct personality traits. The results showed significant differences between American \( (M = 1.12, \text{SD} = 0.37) \) and Indian \( (M = 1.36, \text{SD} = 0.56) \) participants, but both groups attributed the correct personality traits,
Table 13

The Big 5 Factors MANOVA

| Stimulus Condition | Culture     | M     | SD   | Df        | F      | p       |
|--------------------|-------------|-------|------|-----------|--------|---------|
| Smiling Female     | American n = 1097 | 1.12  | 0.37 | (1, 1987) | 124.22 | p < .001 |
|                    | Indian n = 892    | 1.36  | 0.56 |           |        |         |
| Smiling Male       | American n = 1097 | 1.13  | 0.37 | (1, 1987) | 141.89 | p < .001 |
|                    | Indian n = 892    | 1.38  | 0.58 |           |        |         |
| Frowning Female    | American n = 1097 | 2.17  | 0.68 | (1, 1987) | 0.20   | p = .654(NS) |
|                    | Indian n = 892    | 2.15  | 0.82 |           |        |         |
| Frowning Male      | American n = 1097 | 2.16  | 0.66 | (1, 1987) | 0.78   | p = .377(NS) |
|                    | Indian n = 892    | 2.19  | 0.79 |           |        |         |
| Scowling Female    | American n = 1097 | 2.78  | 0.54 | (1, 1987) | 172.08 | p < .001 |
|                    | Indian n = 892    | 2.38  | 0.80 |           |        |         |
| Scowling Male      | American n = 1097 | 2.87  | 0.46 | (1, 1987) | 117.81 | p < .001 |
|                    | Indian n = 892    | 2.58  | 0.72 |           |        |         |

Note: Pillai’s Trace for MANOVA was significant for culture ($V = 0.16, F(6, 1982) = 64.53, p < .001$). The response scale is as follows: Smiling is Extroverted, Conscientious, Emotionally Stable, and Open-Minded = 1; Frowning is Introverted, Conscientious, and Emotionally Stable = 2; and Scowling is Disagreeable, Unconscientious, Emotionally Stable, and Close-Minded = 3.

(extroverted, conscientious, emotionally stable, and open-minded) to the smiling female facial expression. Similar significant mean differences were found between Americans ($M = 1.13, SD = 0.37$) and Indians ($M = 1.38, SD = 0.58$) for the smiling male facial expression, but again both groups attributed the same correct personality traits to the face.
American participants were significantly more accurate \((M = 2.78, SD = 0.54)\), attributing the correct personality traits, (disagreeable, unconscientious, emotionally stable, and close-minded) to the scowling female facial expression compared to the inaccurate personality traits, (extroverted, conscientious, emotionally stable, and open-minded) that Indian \((M = 2.38, SD = 0.80)\) participants attributed to the same expression. There were significant mean differences, between American \((M = 2.87, SD = 0.46)\) and Indian \((M = 2.58, SD = 0.72)\) participants for the scowling male facial expression, although both groups correctly attributed the personality traits, (disagreeable, unconscientious, emotionally stable, and close-minded) to the scowling male facial expression.
CHAPTER V
DISCUSSION

Hypotheses

As proposed in hypothesis 1, that the majority of participants would significantly (accurately) connect smiling to happiness, scowling to anger, and frowning to sadness, with the highest significance (accuracy) occurring for the smiling face, both American and Indian participants significantly (accurately) connected the emotion happy to the smiling female and male facial expressions, sad to the frowning female and male facial expressions, and anger to the scowling female and male facial expressions, with one exception, Indians had lower (less accurate) mean answer choices for the scowling female facial expression. The significantly highest (most accurate) emotion attributions occurred with the smiling female and male expressions. Compared to the frowning and scowling female and male facial expressions, the results for the smiling female and male facial expressions showed the highest mean accuracy, smallest differences in standard deviations between cultures, and nonsignificant univariate ANOVAs.

The results supported the second hypothesis, that facial expressions were hypothesized to show significant differences in personality trait attribution across all four questions. Both American and Indian participants significantly attributed the correct predetermined “happy” personality traits to the smiling female and male facial expressions, the predetermined “sad” personality traits to the frowning female and male facial expressions, and the predetermined “angry” personality traits to the scowling female and male facial expressions for the SAM, Social Perceptions, and Big Five Factors questions, with the same exception: the Indian participants’ significantly lower
(less accurate) answer choice means for the scowling female facial expression on each of the three personality trait questions.

In support of the third hypothesis, that Indian participants were hypothesized to show significantly lower (accuracy) mean answer choices for the negative facial expressions across all four questions compared to Americans, Indians showed significantly lower accuracy in attributing the predetermined (correct) personality traits to the negative expressions, the scowling male and especially the scowling female facial expressions. There were significant mean differences between cultures for both scowling female and male facial expressions. The attributions made to the scowling facial expressions follow the universality of the “Horns Effect” but with cultural differences in temperament attribution to the scowling female facial expression, as noted. There were smaller mean differences between cultures for the frowning female and male facial expressions across the four questions. For the emotion question, Americans showed slightly higher (accuracy) mean answer choices than Indians, with a non-significant mean difference between cultures on the frowning male facial expression and a significant mean difference for the frowning female facial expression. The SAM question showed that Americans had a slightly lower answer choice mean than Indians in attributing the correct predetermined personality traits to the frowning female facial expression but Americans showed slightly higher mean accuracy than Indians for the frowning male facial expression. There was a non-significant mean difference between Americans and Indians for the frowning male facial expression and a significant mean difference for the frowning female facial expression. On the social perceptions question, Americans showed slightly lower accuracy than Indians for the frowning female facial expression
and Americans showed slightly higher accuracy with the frowning male facial expression. The same trend was found with a non-significant mean effect of culture for the frowning male facial expression and a significant cultural effect for the frowning female facial expression. For the Big Five Factors question, the pattern continued with Indians showing slightly higher mean accuracy for the frowning female facial expression and Americans showed slightly higher accuracy for the frowning male facial expression. However, there were non-significant mean differences between Americans and Indians for both the frowning female and male facial expressions. Furthermore, none of these mean differences, significant or non-significant, counter the basic finding — in general most participants made the ‘correct’ negative responses to the frowning faces.

The fourth hypothesis was not supported, which was that Americans will show significantly higher mean accuracy in attributing the predetermined (correct) emotion and personality traits to the appropriate (accurate) facial expressions than the Indian sample. Although Americans showed significantly higher mean accuracy for predetermined emotion and trait attributions on all four questions for the scowling female and male facial expressions, Indian participants had slightly higher (accurate) average answer choices for the frowning female facial expression across the three personality trait questions. On the smiling female and male facial expression conditions, the American participants showed marginally higher (accurate) mean answer choices than Indians especially for the emotion question. The frowning male facial expression conditions for each of the four questions additionally showed small mean differences even though Americans had higher mean (accuracy) answer choices. For the emotion question, the
frowning female facial expression was the only frowning female condition where Americans had smaller mean answer choices than Indians.

**Conclusions**

According to the results, there were different universal perceptions of the three facial expressions. Although there was variability in answer choices for American and Indian participants, the average answers of both groups for each of the four questions were primarily the correct predetermined answer choices according to the universality hypothesis. As hypothesized, there was a non-significant effect of culture for the smiling female and male facial expressions on the emotion question. The frowning male facial expression was the other non-significant cultural effect for the emotion question, but was not supportive of the third hypothesis. For the SAM question, the frowning male facial expression was the one non-significant effect of culture. There was additionally only one non-significant effect of culture for the frowning female facial expression on the Social Perceptions question. The conditions with non-significant effects for the Big Five factors questions were the frowning female and male facial expressions.

The effect of culture and gender, was primarily prevalent with the Indian participants’ incorrect answers for the scowling female facial expression condition across all four questions. Further supporting an effect of culture, Chi-Square Tests of Independence also showed that culture makes a significant difference in the frequency of accurate vs. inaccurate answer choices for emotion perception and personality trait attribution. Analyses showed significant results for the all three female facial expressions on the emotion question: sad ($\chi^2 = 20.72$, DF = 1, $p < .001$), happy ($\chi^2 = 404.21$, DF = 1, $p < .001$), and angry ($\chi^2 = 101.59$, DF = 1, $p < .001$).
Evidence of grouping personality traits based on people’s appearances was first discovered by Edward Thorndike (1920). He named this phenomenon the “Halo Effect.” This occurs when we unconsciously attribute positive personality traits to a person using a global characteristic (such as good, happy, or attractive) (Dion et al., 1972). Clearly there is also a “Horns Effect” which occurs when we use a global characteristic (such as bad, angry, or unattractive) to attribute negative personality traits to a person (Nisbett & Wilson, 1977).

In this study, when sad and angry faces were judged as not attractive, more negative personality traits were associated with individuals. The opposite was true for smiling (happy) faces which were seen as more attractive and attributed with positive personality traits, supporting the Dion et al. (1972) findings. Gender of the model in the photo did not make a difference in trait attribution and attractiveness ratings across each facial expression except for the scowling female facial expression on all four questions. Indian participants incorrectly attributed disgust to the scowling female facial expression. The incorrect personality traits negative, submissive, and calm were attributed by the Indian participants to the scowling female facial expression on the SAM question. The Indian participants also attributed incorrect personality traits for the social perceptions question (not pleasing to look at, unattractive, not threatening, and good) to the scowling female facial expression. On the Big Five Factors question, the Indian participants chose the incorrect sad personality traits (introverted, conscientious, and emotionally stable) for the scowling female facial expression. The results showed no other incorrect answer choices across both cultures. Although we assume that this grouping of answers would be
associated with sadness, Indian participants in this study associated these responses with disgust.

This inability to see anger in the faces could be because displays of anger are culturally different. People from India may use their whole body to display gesturing and other indicative angry body language while Americans might express anger more discretely and facially. Additionally, body language is based on the situation context in collectivist cultures such as India. In a study by Kapoor et al. (2003), Indians valued interdependent self-construal which aligns with collectivism. The results from Verma and Triandis (1999) found support for the importance of collectivist values to Indians, such as personal relationships and hierarchy. Considering these cultural practices, Indians most likely refrain from displaying extreme emotions, especially anger, with strangers to cultivate valued social relationships and avoid disturbing the harmony of the social group (Matsumoto, 1989, 1992a; Schimmack, 1996). As a result, this could cause difficulty in identifying facial anger (Matsumoto, 1989, 1992a; Schimmack, 1996).

Although Indians lean towards vertical collectivism in comparison to Western cultures, there have been results also showing a preference for horizontal collectivism in younger Indians (Verma & Triandis, 1999; Kapoor et al., 2003). Vertical orientation emphasizes hierarchy while horizontal orientation focuses on equality. These presumably growing changes could have resulted in higher mean answer choice accuracy for Indians on the frowning (negative) facial expressions. However, Indian participants’ answer choices were significantly lower for the scowling faces even though anger can be considered as the most extreme example of a negative facial expression. The use of Caucasian faces and the facial similarities of angry faces to displays of disgust and
sadness generally could have been confounding factors contributing to these outcomes despite similar accuracy to Americans on the frowning and smiling conditions regardless of gender. Additionally, the female scowling facial expression might have been less dramatic in showing anger than the male scowling face. The male model displayed teeth, lower eyebrows in a deeper “V” shape in the forehead area, and a more obvious angry grimace than the female model. This could have added confusion in interpreting the degree of anger the female model was showing. The differences in accuracy could have resulted from the limitations of this study.

**Limitations**

The limitations of this study include: a lack of control over the events occurring when participants filled out the survey, the settings where the survey was taken, or how participants filled out the survey. These conditions can influence how the survey was taken and create larger variability in their answers. Some participants spent a longer time than average to finish filling out the survey. If participants took longer than average, then they were potentially not following the directions to view the pictures for 15 seconds and answer the questions quickly, which could invalidate their data. Those who spent a significantly longer amount of time (more than 30 minutes) to complete the survey were removed from the data analysis. Facial structure of the females and males in the photographs could not be specifically controlled to the same degree as the 3D computer generated faces used in Todorov et al. (2013). All faces have slight differences in bone structure that could influence how the face is judged, but computer-generated faces can produce the same facial structures regardless of gender to control for those differences. Only one set of photographs was used and the models in the photographs were all
Caucasian. Using more than one set of photographs could show if similar or different results could be replicated with more than one set to determine the validity of the survey results. For the photographs, Indian participants might have had more difficulty in interpreting the facial expressions because the models in photographs were not Indian, which they would have more familiarity with seeing on a daily basis. Also, English was a second language for most of the Indian participants, which may have led to confusion about the wording in the responses. Finally, there was a lack of previous research support for the scaling used in this study. Despite these limitations, the four MANOVAs were all significant in addition to almost completely correct answer choices across each of the stimulus conditions on all four questions for both cultures.

**Future Directions**

The results of this study suggest the presence of Halo and Horns effects when encountering a stranger’s face for the first time. This is presumably evidence of instantaneously grouping traits based on particular global characteristics. Even though the face is such an important nonverbal communication tool in judging personality traits, it is still unclear which facial factor (age, attractiveness, expression, gender, race, structure) is focused on when people make trait inferences. Two of these factors were investigated in this study. Future research intends to address the remaining four factors, age, attractiveness, race, and facial structure. Additionally, the culture of the perceivers will continue to be studied. Future studies could replicate this study with more countries. Other future changes will be the separation of answer choices, and Likert scales will be used as the scaling for answer choices.
Summary

The study found support for the universality of the “Halo” and “Horns” effects especially regarding smiling and frowning. The highest accuracy was mixed between the Americans and Indians for the smiling and frowning facial expressions depending on each question. Americans and Indians showed slight but significant variability on accuracy with the three personality trait questions for the smiling female and male facial expressions. The scowling female and male facial expressions displayed the greatest accuracy and probable cultural differences. American and Indian participants chose the same correct mean answers for all three facial expressions across the four questions, except for the Indian participants on the scowling female facial expression in all four questions. These results were further supported with additional analyses on facial expression and gender, separate from culture. Regardless of culture, responses to all four questions showed significant accuracy and very large effect sizes across the three facial expressions, frowning, smiling, and scowling. The gender only analysis showed significance difference between answer choices based on whether the model in the photo was female or male for all four questions. However, gender effects sizes were very small for each of the four questions.

The cultural differences found might be explained by India’s collectivist tendencies, in which family, personal connections, and hierarchy are highly valued. India has been referred to as a point where two larger sociocultural areas meet because of the diverging but similar traditions of the northern and the southern regions within India (Dyson & Moore, 1983). Even though India incorporates collectivist and individualist values, Indians orient with vertical collectivism more often (Verma & Triandis, 1999;
Kapoor et al., 2003). When valuing social and group connections, displays of happiness would strengthen those connections while being sensitive to smaller displays of sadness would also be important to maintain group harmony. Collectivist cultures such as India could be more likely to refrain from extreme negative emotions, especially anger, to preserve social relationships (Matsumoto, 1989, 1992a; Schimmack, 1996). These could be possible explanations for the Indian participants’ difficulty in interpreting the scowling facial expressions despite the high accuracy for the smiling and frowning facial expressions regardless of gender.
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APPENDIXES

APPENDIX A

SELF-ASSESSMENT MANIKIN

(SAM; Bradley & Lang, 1994)

Positive/Negative

Subordinate/Dominant

Excited/Calm
APPENDIX B

MINIMARKERS (MM; Saucier, 1994)

- Extroversion:
  - Talkative, extroverted, bold, energetic
- Agreeable
  - Sympathetic, warm, kind, cooperative
- Conscientious
  - Organized, efficient, systematic, practical
- Emotionally stable
  - Unenvious, relaxed
- Open
  - Creative, imaginative, philosophical, intellectual, complex, deep
- Introversion:
  - Shy, quiet, bashful, withdrawn
- Disagreeable
  - Cold, unsympathetic, rude, harsh
- Unconscientious
  - Disorganized, sloppy, inefficient, careless
- Emotionally unstable
  - Moody, jealous, temperamental, envious, touchy, fretful
- Closed
  - Uncreative, unintellectual
APPENDIX C

FACIAL PHOTOGRAPHS

Angry Female and Male

Happy Female and Male

Sad Female and Male