A Cultural Comparison of Two Facial Inference Studies

Janine Swiney, Anthony Stahelski, & Mary Radeke

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Abstract

This study compared results from two different cultural samples, the United States and Pakistan. The two studies used Amazon.com's Mechanical Turk (MTurk) to investigate the facial inference process. Participants in this study were asked to infer the emotions and personality traits shown in three facial expressions (angry, sad, happy) of young white females and males in six photographs. Each picture was presented for 10 seconds followed by four 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 consist of condensed sets of the Big Five personality adjective markers (Saucier, 1994), the three Self-Assessment Manikin dimensions (SAM) (Bradley & Lang, 1994), and items related to attractiveness, perceived motivation and morality inferences. The statistical comparison across the two studies utilized a 2 (gender) X 3 (facial expression) X 2 (country) repeated-measures design.

Overall, the American sample showed significantly higher accuracy (above 67% except on Question 3 for both genders) in attributing the correct facial expression and personality traits across each picture for both genders compared to the Pakistan sample. The Pakistan sample showed the highest accuracy, above 70%, across the four questions for the happy female and male pictures. The lowest overall accuracy, below 65%, in the Pakistan sample was for the sad female and male pictures across each of the four questions. Possible causes of similarities and differences between the two samples will be presented.

Literature Review

Trait Inference
- Evidence of facial features revealing the personality characteristics of strangers, 'kernel of truth hypothesis,' using the EEP(Eysenck et al., 1996; Berry & Wero, 1993, p. 498; Shevlin, Walker, Banyard, & Lewis, 2003).
- Emotional expression has been related to perceived attractiveness (Golle, Mast, & Lobmaier (2014).
- There is evidence of a relation between perception of social dominance and submissiveness and facial expression (Hereli, Shomrat, & Hess, 2009).

Trait Grouping
- Nisbett & Wilson (1977) were early pioneers in researching the unconscious attribution of positive personality traits (halo effect) or negative personality traits (horns effect) using a global characteristic (positive: good, happy, or attractive; negative: bad, angry, or unattractive).
- Previous literature has shown that women were rated significantly higher on positive personality attributes when participants were provided a positive description or no description of a woman in a picture compared to a negative description (Lammers, Davis, Davidson, & Hogue, 2016). However, the women were rated as equally attractive across each description condition.
- Another study investigated the attractiveness halo effect (more attractive people are seen more positively) and babyface stereotypes (more childlike impressions of more babyfaced people) of older and younger neutral expressions (Zebrowitz & Franklin, 2014). Old adult and young adult participants exhibited an attractiveness halo effect and the babyface stereotype for old and young faces, but stronger face stereotypes were found for faces closer to the participants' age (Zebrowitz & Franklin, 2014).
- Personality inference groupings used for the answer choices were verified by Radeke and Stahelski (2014) in a longer form of this study. The three S.A.M. temperament dimensions, 40 adjective markers for the Big 5 personality traits, and other characteristics were tested for trait grouping based on facial expression (happy, angry, and sad). The results found evidence of halo and horns effects. The personality inferences made are represented in the vertical axis of each line graph.

MTurk
- MTurk is considered to be an inexpensive and convenient tool for recruiting participants from diverse subject pools (Berinsky, Huber, & Lenz, 2011).
- Despite concerns over the validity and reliability of MTurk, Berinsky et al. (2011) found MTurk participants to be more representative of the population and was an inexpensive tool used for recruiting.
- MTurk participants respond in a consistent manner to stimuli, are not an overused pool, and habitual responding was a minor concern (Berinsky et al., 2011).

Research Objectives:

1. To assess the emotions that are attributed to the three facial expressions.
2. To identify which personality traits are attributed to the three facial expressions.
3. To determine the degree of perceived attractiveness, motivation, and morality based on the facial expression.
4. To compare the inferred emotions, personality traits, and other perceptions across facial expressions.
5. To compare the inferred emotions, personality traits, and other perceptions across the two cultures.

Research Questions and Hypotheses

Research Questions

1. Is there a difference in attributed temperament and personality traits, and other responses across facial expression?
2. Is there a difference in which personality traits are attributed to the female vs. male photographs for each facial expression?
3. Is there a difference in which personality traits are attributed across the two cultures?

Hypotheses

1. Most participants will accurately connect the appropriate facial expression to the appropriate emotion, with the greatest accuracy occurring with the smiling face – happy emotion connection.
2. Traits will be differentially attributed to the three facial expressions:
   - The "**happy**" face attributions: attractive, pleasing to look at, good, not threatening, positive, agreeable, conscientious, extroverted, and open-minded.
   - The "**angry**" face attributions: unattractive, not pleasing to look at, bad, threatening, negative, dominant, excitable, disagreeable, unconscientious, and close-minded.
   - The "**sad**" face attributions: unattractive, not pleasing to look at, good, not threatening, positive, submissive, and calm.
3. There will be somewhat more accurate facial expressions and trait connections in the American sample than in the Pakistan sample.

Method For Both Studies

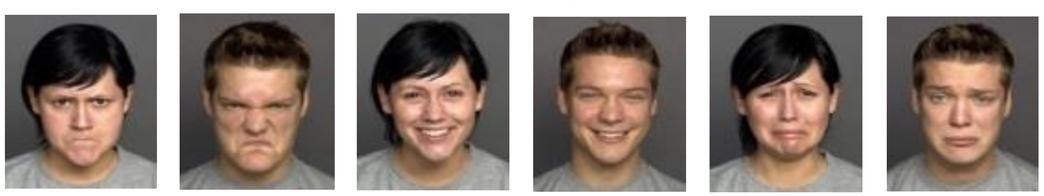
Participants
- 177 American participants 18-65+ years old from a variety of careers were recruited using Amazon.com's Mechanical Turk (MTurk) survey platform. There was an age requirement of 18+ to participate. Compensation for participating was $1.00.
- 65 Pakistan participants ages 18-65+ from various careers were recruited using MTurk. Participants were required to be 18+ and from the geographic location of Pakistan to participate. Compensation for participating was $1.00.

Instruments/Materials
- **Minimarkers:** A Big Five personality trait assessment (MM; Saucier, 1994).
- **Self-Assessment Manikin (SAM):** measures perception of Excited/Calm; Subordinate/Dominant; and Positive/Negative temperament dimensions.
- **Qualtrics & Amazon.com's MTurk:** a weblink to the survey in Qualtrics was provided by the MTurk HIT.
- **Photographs:** three female and three male photographs featuring the shoulders to the head. There was one female and one male for each of the three facial expressions (happy, sad, and angry). Photographs 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 consisted of three young white female and three young white male faces. There was one female and male face expressing each of the three emotions (happy, sad, and angry).

Procedure

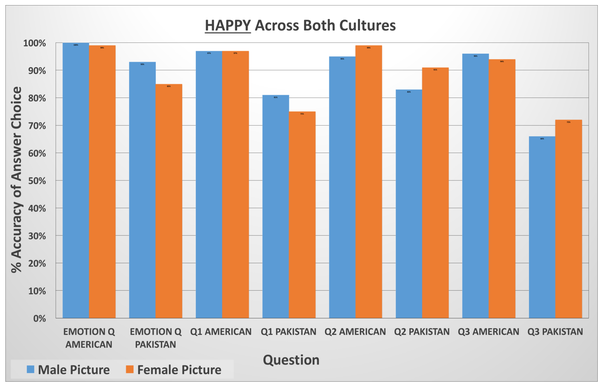
1. Participants who are members of Amazon.com selected our survey (HIT) from a list provided by MTurk if they qualified. A weblink that was included in the HIT redirected participants to the survey in Qualtrics.
2. Participants first agreed to take part in the survey and next answered demographic questions.
3. Participants were asked to view the first photograph in 10 seconds and then answer four questions about that photograph.
4. The same procedure was followed for the following five photographs.
5. Participants were textually debriefed after finishing the survey.

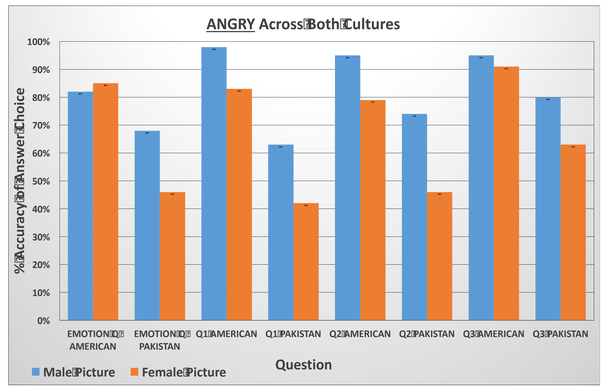
Facial Photographs

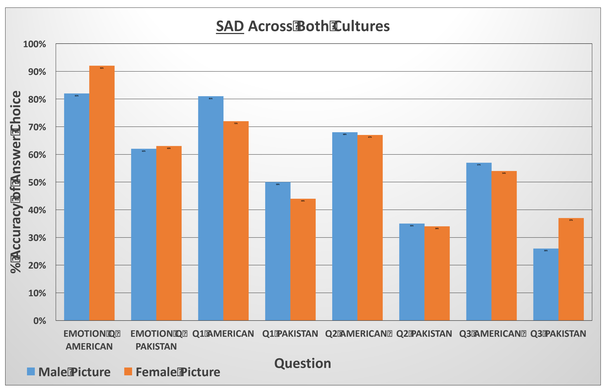


Angry Female | Angry Male | Happy Female | Happy Male | Sad Female | Sad Male

Results







Inferential Test Results

- The American sample significantly attributed the accurate personality traits for Question 1 (70+%) across each facial expression. Pakistani participants also significantly attributed the correct personality traits on question 1 (around 50+%) for sad and happy facial expressions across gender except for angry female and male expressions which were perceived as negative, submissive, and calm on average.
- American participants again significantly attributed the correct personality traits (67+%) across each facial expression for Question 2. Although the Pakistani participants showed significantly higher accuracy rates (67+%) for Question 2 across each question and gender, they incorrectly attributed the personality traits, pleasing to look at, attractive, not threatening, and good, to sad female and male expressions and the angry female expression. They significantly attributed the correct personality traits to happy female and male facial expressions and the angry male expression (74+%).

Inferential Test Results (Continued)

- Pakistan participants showed significantly lower accuracy (26-80%) on Question 3 while the American participants continued to chose the accurate personality traits for each facial expression (54+%). Pakistan participants showed significant inaccuracy in choosing personality traits for each of the female and male expressions for Question 3, all pairwise comparisons were $p > .05$, except for happy female and male expressions and the angry male expression $p < .05$. Sad female and male facial expressions and the angry female expression were incorrectly perceived as extroverted, conscientious, emotionally stable, and open-minded.
- The four repeated-measures ANOVAS performed were all single factor ANOVAS with three levels (the three facial expressions) for both samples. The Bonferroni adjusted alpha correction was made for the four ANOVAS at $p = .0125$. Normality assumptions were met except for Mauchly's Test of Sphericity on all four ANOVAS in both samples.
- The ANOVAS conducted for the American and Pakistan sample were all significant at $p < .001$.
- All the American pairwise comparisons were significant at $p < .001$ between facial expression but not gender, with the exception of the happy and sad expression in the BIG 5 question (Question 3). In comparison, the results of the Pakistan sample showed a mixture of significant and nonsignificant gender and personality trait differences in the pairwise comparisons across each question.
- While the American sample accurately attributed the correct emotional expressions and personality traits (50+%) for each of the four questions, the Pakistan sample showed considerably more variability in their answers (such as rating the angry female expression as disgusted).

Discussion

Evidence of grouping personality traits based on peoples' appearances was first discovered by Edward Thorndike. 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). 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.

The results also showed support of Darwin's Universality Hypothesis. The Universality Hypothesis says that there are six basic facial expressions that can be interpreted worldwide despite cultural differences. Participants from both cultures responded to the happy faces in the same way. The Pakistan and American sample showed the highest accuracy for the four happy questions. Happy faces may have more distinct features that are easier to read. For example, the corners of eyes and your mouth clearly turn up and stretch into thinner features when someone displays a truly happy face. However, there was significantly lower accuracy when interpreting angry and sad female and male faces. This could be because displays of sadness might have the largest cultural differences. People from Pakistan may show sadness using their whole body, such as gesturing and using more body language while Americans might express sadness more discretely and facially.

In support of our first hypothesis, American and Pakistan samples displayed the highest accuracy in attributing the correct emotions and personality traits to happy faces across gender. There was less support in regards to the second and third hypotheses when it came to differentially but accurately attributing emotions and personality traits to each of the three facial expressions for the Pakistan sample but not the American sample. American participants accurately chose the correct answer between 54-100% of the time for each of the four questions. However, as predicted in the third hypothesis, Pakistani participants showed significantly lower accuracy and variability in choosing the correct answer choice, around 26-93%, across each facial expression and gender.

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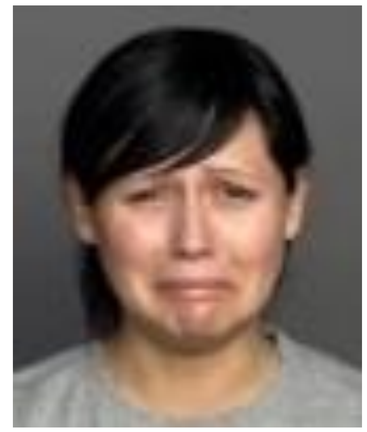
Angry Female

Angry Male

Happy Female

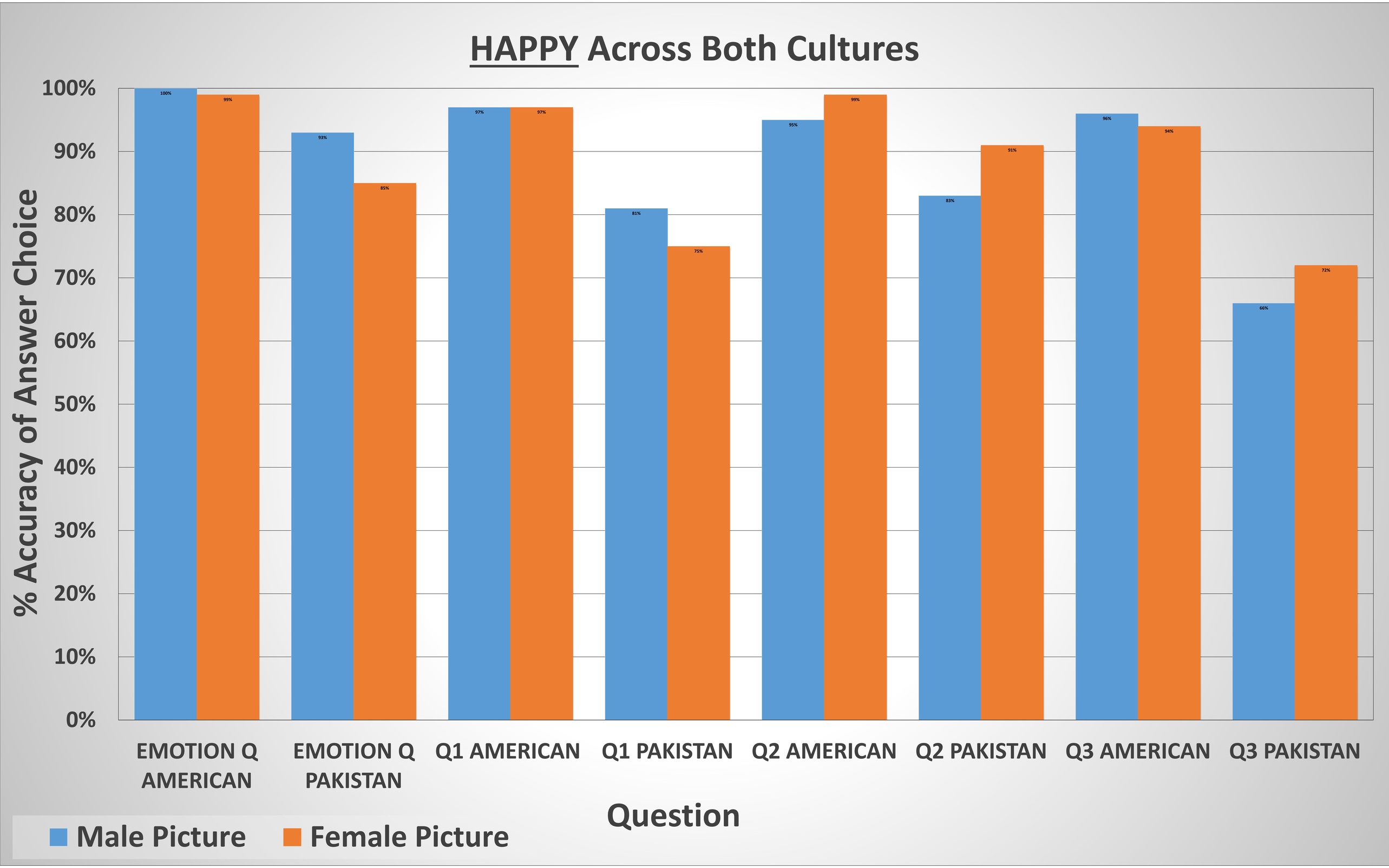
Happy Male



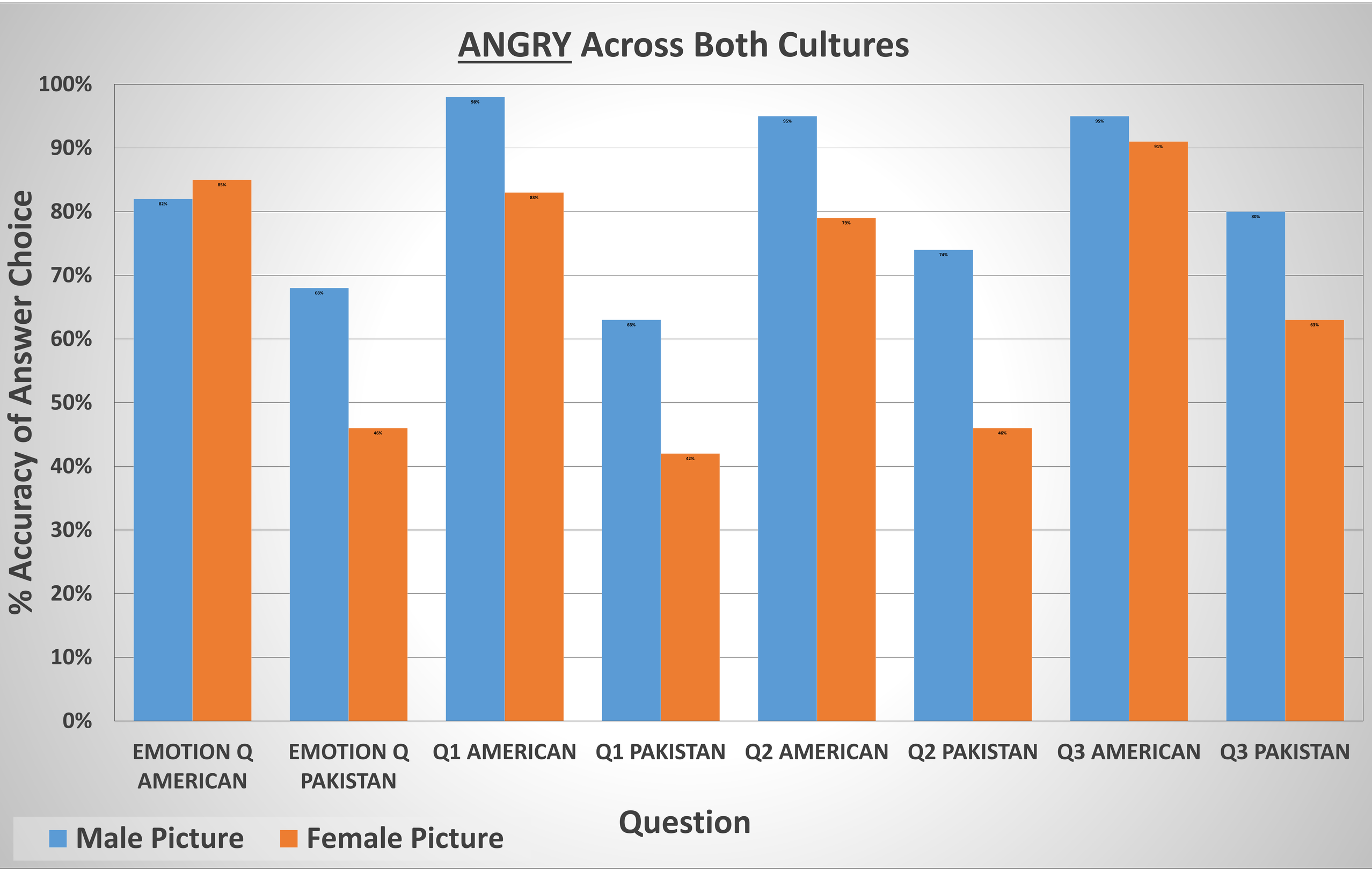
Sad Female

Sad Male

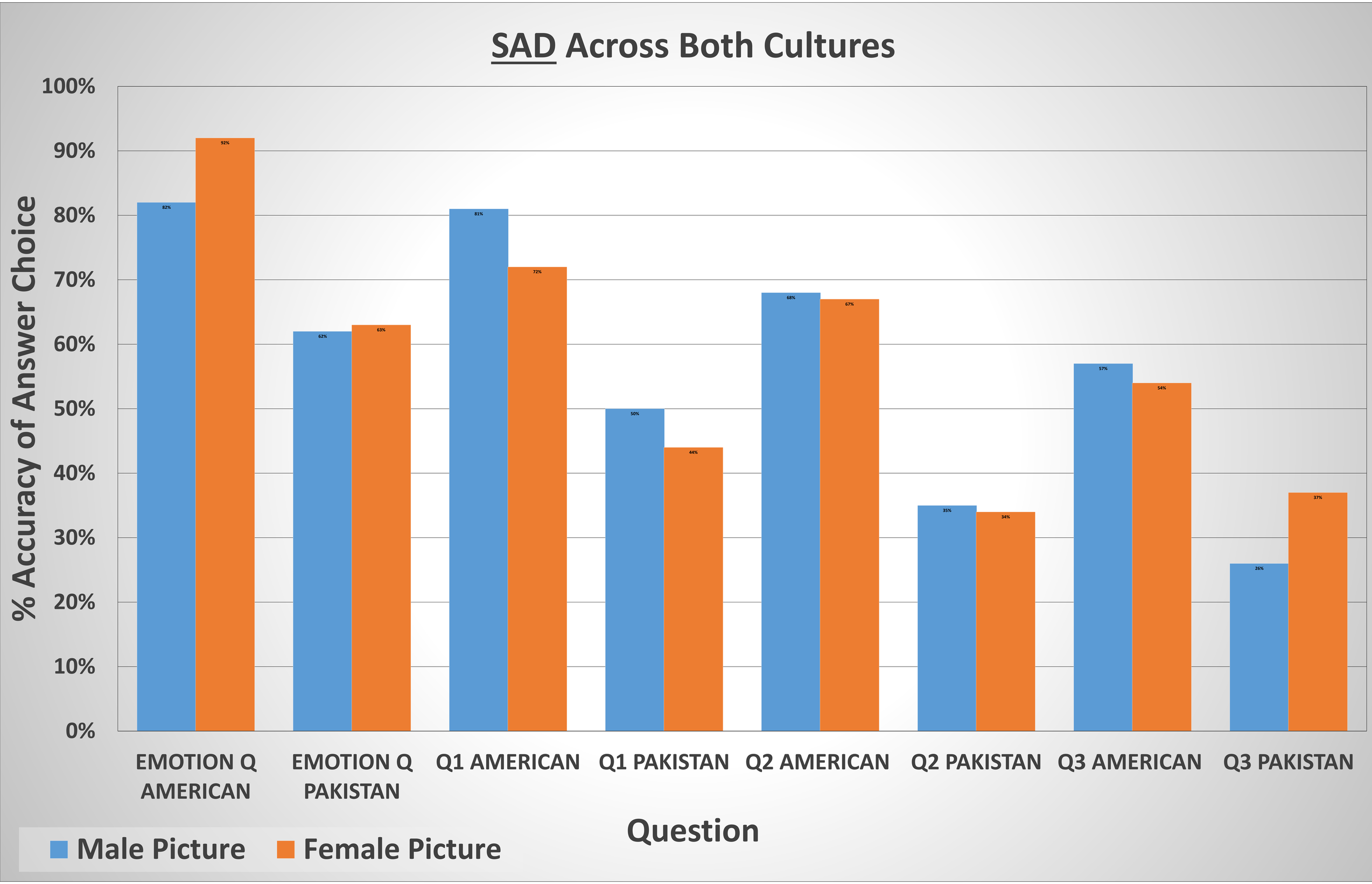
Results


HAPPY Across Both Cultures
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Accuracy of Answer Choice
100%
99%
93%
85%
97%
97%
81%
75%
95%
99%
83%
91%
96%
94%
66%
72%
EMOTION Q AMERICAN
EMOTION Q PAKISTAN
Q1 AMERICAN
Q1 PAKISTAN
Q2 AMERICAN
Q2 PAKISTAN
Q3 AMERICAN
Q3 PAKISTAN
Question
Male Picture
Female Picture

ANGRY Across Both Cultures



SAD Across Both Cultures



Inferential Test Results

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The accuracy of the Pakistan sample for angry and sad faces were significantly different compared the American sample. Pakistan participants showed significantly lower accuracy in attributing the correct emotions and personality traits across female and male sad and angry facial expressions. However, Pakistan participants were more accurate on the four questions related to angry male faces (close to the accuracy of the happy faces). Pakistan participants were primarily male and might have less exposure to angry and sad female faces because most women cover their faces. Angry and sad expressions could be harder to interpret without being able to see the mouth and only the eyes compared to happy expressions.

The Pakistan sample showed the lowest accuracy average on the four questions for sad female and male expressions. In comparison, the American sample showed similar accuracy between sad and angry female and male expressions. This could be because displays of sadness might have the largest cultural differences. People from Pakistan may show sadness using their whole body, such as gesturing and more body language while Americans might express sadness more discretely and facially.

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.

Limitations

- There was no control over the time and/or events occurring when participants filled out the survey, the setting where the survey was taken, or how participants filled out the survey.
- Some participants spent a longer time than average to finish filling out the survey. Those who spent a significantly longer amount of time to complete the survey were removed.
- Facial structure of the females and males in the photographs could not be specifically controlled in degrees such as the 3D computer generated faces in Todorov et al. (2013).
- Only one set of photographs was used.
- English was a second language for the Pakistan participants.

References

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