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# GENDER DIFFERENCES IN PAREIDOLIA AND ANGER PERCEPTION OF VEHICLE FRONT ENDS

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Two original studies about pareidolia and anger perception are compared. The first study was a survey about seeing faces in the styling of the front-end of vehicles in production. The second study was a simulation about the perception of anger in graphics of possible car styles. Attributes of the vehicle designs that could be seen as anthropomorphically angry were related to survey responses. The level of automobile features were correlated to the participant responses by gender. Men and women generally used the same features such as the lights which might represent the eyes of a face, and air intakes which might represent the mouth of a face. However, there were statistically significant differences in how men and women favored different features when interpreting a car's so-called "angry expression." The results suggest that different visual processes may be used by men and women when interpreting anger in inanimate objects.

Keywords: Face recognition; Emotions; Anger; Gender differences; Pareidolia.

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This research started with the goal of determining if angry-looking vehicle design caused drivers that saw it to respond with aggressive driving. Anthropomorphism is attributing human characteristics to nonliving objects. A specific aspect of anthropomorphism is pareidolia which is recognizing an object as a face. Previous researchers have shown that seeing the front end of a car activates the same areas of the brain as facial recognition of humans (Kühn, Brick, Müller, & Gallinat, 2014). The initial rationale for the first study was to determine gender differences in aggressive driving, and not to study gender difference in perception. However, as the authors noticed gender effects in perception, it became a consideration.

It has been shown that women are more likely to see faces in inanimate objects such as arrangements of food on a plate (Pavlova, Scheffler, & Sokolov, 2015). The eyes are the primary feature that people look at when seeing faces and determining emotions (Tian, Kanade, & Cohn, 2001). However, other facial features and postures are indicators of emotion too (Ekman & Friesen, 1978). Additional, nonvisual cues to emotion include tone of voice (Scherer, 2003). Women may have evolved to have greater ability to interpret emotions throughout history in their traditional role as nurturers.

Through a process known as mirroring, people copy the facial expressions of the people around them (Iacoboni, 2008). This is often an unconscious reaction (Dimberg, Thunberg, & Elmehed, 2000). Additionally, people behave in ways that match what people around them are doing. Women have been shown to show more emotional contagion, so this explains why they might respond more to seeing a car that is styled in a way that can be interpreted as angry (Doherty, 1997).

Yet, men might respond to a design that might be interpreted as angry for other reasons. Men are more likely to respond to anger seen in other men's faces (Fischer, Fransson, Wright, & Bäckman, 2004). A posed evolutionary explanation for this is that throughout history men might have had to protect territories from other men. Therefore, the authors of this study wanted to investigate which gender responded more overall to cars, because their designs have ambiguous gender.

Aggressive drivers exhibit behaviors that are more likely to engage them in accidents. There is a relationship between anger and aggressive driving (Nesbit, Conger, & Conger, 2007). Therefore, the initial goal of this research was to see if car styling related to driving behavior. In a first study conducted below, it was unanticipated that gender influences on perception would be found, so a second study was done to confirm. This gender difference suggested men and women might be using differing processes or information to evaluate faces. This calls for closer investigation of visual processes tied to emotion.

It is known that women have greater skill in rating emotions (Thayer & Johnsen, 2000). Also, from infancy they have a greater interest in looking at faces than men, who prefer looking at moving objects (Sax, 2017). There may be a relation between skill and interest. Skill at rating emotions could be developed from practice looking at faces, or because women have an innate skill that might increase interest in looking at faces.

However, little is known about whether women's greater sensitivity to interpreting faces is caused by or develops additional processes that men do not have. Determining emotion in a face first requires interpreting an object as a face, so emotional interpretation is beyond just seeing faces. Each emotion is handled differently by the brain because each emotion has dedicated distinct brain circuits, some of which are present at birth (Ekman, 1992). Therefore, any conclusion here about anger might not apply to other emotions.

Previous researchers have shown that there are some similarities and differences between men and women related to feelings of anger. Men and women report feeling anger at the same level, but men are more likely to express it more intensely (Brizendine, 2006). Since there are some reported differences, it is possible that the visual processes men and women use could also have variation. Two competing theories for this research are: 1) in general, women are more refined in rating emotion because they use additional processes; or 2) men and women use the same processes, but women are just more practiced at applying them. Emotional reaction happens extremely fast. People respond as quickly as 300-400 ms when seeing faces expressing emotions of happiness or anger (Dimberg, & Thunberg, 1998). Interpretation of emotions needs to be quick because the visual manifestation of the emotion may only last a few seconds (Frijda, Mesquita, Sonnemans, & Van Goozen, 1991). This supports that rating emotions needs to be an automatic process with little cogitation. The theories are tested in this research by comparing the variation of response by gender and by the response time.

Two studies were conducted related to gender difference in perceiving anger in car faces. The first study will be referred to as the photo study. In that study, photos of the front and back ends of popular vehicles (cars, trucks, SUVs, crossovers) were shown to participants and they rated each on whether it looked like a face and how angry it appeared. The initial purpose was to see which vehicles were perceived as looking angry and why, but then the purpose was modified when it was found that there were differences in how men and women were rating vehicles. After this was found, a second study was performed that could confirm the findings of the first study. The second study will be referred to as the virtual study. In that study, respondents completed a simulation that was designed to more thoroughly study the patterns found.

## PHOTO STUDY

### Method

Ninety-six people aged 18 to 72 participated in this study, 42 of which were female and 54 were male. They were surveyed predominantly in professional offices with permission of the office managers. Respondents that had no ability or very limited ability to recognize a face in an inanimate object were removed before analysis. Four male participants were removed because they rated only two or fewer fronts or backs of vehicles out of the first page of seven vehicles as looking like a face.

In the photo study, a total of 213 photos were used. A sample photo is shown in Figure B1 (see Appendix B) for a 2008-2011 Ford Fusion. All images were converted to grayscale and printed on copier paper. The photos were edited to show only the front or back end of the vehicle and scaled to 3.25 inches wide.

The question that each participant was asked for the first form was, "For each photo below, please answer: Do you think this looks like a face or an angry expression? 1 = *not at all*, 2 = *a little*, 3 = *some*, 4 = *much*, 5 = *very much*." Two labels, "a face" or "an expression," were under each image with five numbers. For the second and third form the prompt was "Do you think this looks like an angry expression?" Those responses were correlated to design features as shown in Appendix A by the processes discussed by Hoback (2018).

In the photo study, the style features in the cars were identified according to their relationships to facial features in Appendix A. Then, each of those features were measured or rated in the 213 car photos. For example, in Figure B1 (see Appendix B), the vehicle front has lights that slope downward toward the center, a hood that slopes inward, a wide light aspect, and air dams that slope outward toward the bottom. The 213 vehicles were the models sold in the USA by the top automakers in the last decade.

### Results

Each style feature in Appendix A was measured for all vehicles. For example, the variable Iris-Size is a measurement of the light bulb within the head lamp measured in mm when printed with the vehicle width as 3.25 inches (82.6 mm) on copy paper. Ratings of anger in vehicle styling were collected. Next, these results were used to determine which vehicle styling features were used by the participants to determine if a vehicle looked angry.

Multiple regression was performed to find the significance of each style feature as a predictor of perceived anger. The *t*-test for each predictor is shown in Table 1. Many predictors were significant. Finding that the Eye-Top-Angle was significant was odd because eyes in humans do not change direction based on emotion. Instead, there may have been a confounding effect that car designers appear to use the same alignment for the vehicle headlight as the hood, so participants could have been seeing angled eyes instead a raised eyebrow.

Next, the differences between genders were considered. Men and women had the same average overall of perceived anger for all vehicles. However, a multiple regression was performed for men and women independently. The regression results were not the same, but genders had differing sensitivities to visual information. Therefore, regression coefficients and standard errors for each variable were compared using a *t*-test to see independently which features men and women were using when rating anger in vehicles styles. To analyze this, first the pooled standard deviation was found, and then the *t*-test was calculated. The *t*-test also provided whether there were significant differences in those ratings. In Table 2, it is shown that men and women were using *Iris-Size* and *Lips* differently.

TABLE 1
Regression analysis for photo study, unstandardized coefficients

| | Coefficients | Standard error | *t*-test | *p* |
|---|---|---|---|---|
| Intercept | 1.94 | .22 | 8.89 | < .001 |
| Eye-Pinched | .12 | .05 | 2.34 | .020 |
| Bulges | .08 | .06 | 1.39 | .167 |
| Frown | .13 | .05 | 2.67 | .008 |
| Eye-Top-Angle | .01 | .00 | 2.58 | .011 |
| Mouth-Area | .00 | .00 | 2.88 | .004 |
| Unibrow | .16 | .04 | 3.55 | < .001 |
| Lightness | –.02 | .02 | –1.25 | .214 |
| Iris-Size | –.12 | .02 | –5.86 | < .001 |
| Lips | .12 | .03 | 3.58 | < .001 |

TABLE 2
Analysis of sensitivities for men versus women in photo study, unstandardized coefficients

| | Coefficients males | Coefficients females | Standard error males | Standard error females | Pooled error | *t*-test | *p* |
|---|---|---|---|---|---|---|---|
| Intercept | 2.77 | 1.97 | .47 | .51 | .49 | 4.49 | .001 |
| Eye-Pinched | .16 | .20 | .12 | .14 | .13 | –0.74 | .460 |
| Bulges | –.08 | .03 | .12 | .13 | .13 | –2.22 | .030 |
| Frown | .24 | .16 | .09 | .10 | .10 | 2.14 | .035 |
| Eye-Top-Angle | .00 | .01 | .01 | .01 | .01 | –0.40 | .690 |
| Mouth-Area | .00 | .00 | .00 | .00 | .00 | –2.68 | .008 |
| Unibrow | .35 | .41 | .09 | .10 | .09 | –1.77 | .080 |
| Lightness | –.07 | –.03 | .04 | .04 | .04 | –2.58 | .010 |
| Iris-Size | –.20 | –.16 | .05 | .05 | .05 | –2.37 | .020 |
| Lips | .06 | .14 | .07 | .08 | .08 | –2.81 | .006 |

## Discussion

The mouth is important for determining anger, and that is reflected in some of the variables in Appendix A. Many of these variables (Lips, Mouth-Area, Frown) are significant overall as seen in Table 1. Table 2 shows that there was also a significant difference between men and women in how much they were relying on these features with women more likely to use those cues. Since women had more significant predictors, that suggests they were looking at more information when rating anger.

The variable *Bulges* was not significant overall as shown in Table 1. This suggests that people were not considering cheek details in rating the emotion. However, in Table 2, it is shown there is a gender difference between the ratings of Bulges. The statistical interpretation of this is that when data from men and women are lumped, their significant but opposing uses of this variable wash each other out. However, both men and women were apparently using cheek details to rate anger.

## VIRTUAL STUDY

### Method

A limitation of the design of the photo study is that there is no control over the vehicle designs, so it is possible that unanticipated results could come from anthropomorphic features unobserved by the researchers, or other confounding car style issues. Therefore, in the virtual study, greater control over the images was maintained by mixing and matching different sorts of vehicle design features such as differently shaped headlights. The variables identified in the first study in Appendix A were used to methodically vary the car style features in the virtual study. Additionally, other possible factors came to mind that could be studied: asymmetry, iris shape, and confusion or cluttered design. These are not human features, but common in car features.

In the virtual study, 60 college students performed a simulation where they manipulated and rated synthetically created images of vehicle front ends. In that study, 26 participants were female and 34 were male.

Participants were screened by asking, "Do you see a face in the first vehicle?" If the answer was no, then they did not participate. If a student was disqualified, they were not counted as participants, so there is no record of how often this happened.

Figure B2 (see Appendix B) shows a sample vehicle that participants rated in the virtual study. They answered, "Does this look like an angry expression?" by selecting: 5 = *very much*, 4 = *much*, 3 = *some*, 2 = *a little*, or 1 = *not at all*. There were 20 style variations that they rated this way.

In the virtual study, all of the vehicle style features were controlled. For example, in Figure B3 (see Appendix B), both headlights were sloped down at 5 degrees, the dark line hood detail was thin and straight, but the air dams were different. On the left was a trapezoidal opening with a thin dam around it, but the "lips" on the right were twice as thick on the rectangular mouth. Each vehicle feature was created independently in photo editing software. The features were adjusted in size and rotation when creating the simulation. The simulation was performed in Macromedia's Director version 8.5. Cases were created that emphasized each of the vehicle features so that the effect of each could be quantified.

Additionally, participants had 33 screens where they compared two variations in styling and varied one design feature on the right vehicle by dragging a slider bar so that the two sides looked about equally angry. They were prompted "Please move the slider to change the right car so it is just angrier than the one on the left." In Figure B3 (see Appendix B), the mouth size on the right was controlled by the participant. The purpose of this type of data collection was to see if there were fine differences between how men and women used various features to determine the emotional expression.

### Results

For the virtual study, many variables were significant with *p*-values of .062 or less, as seen in Table 3. This confirms the result from the photo study, that is that people associate certain design features with anger. Many of the newest non-anthropomorphic variables were significant. Table 4 shows gender differences for the virtual study. Some of the same gender differences were also found in the photo study such as the variables *Iris-size* and *Lips*.

TABLE 3
Regression analysis for the virtual study, unstandardized coefficients

| | Coefficients | Standard error | *t*-test | *p* |
|---|---|---|---|---|
| Intercept | –2.19 | .51 | –4.27 | .004 |
| Mouth-Area | –.75 | .23 | –3.22 | .015 |
| Lips | .56 | .14 | 4.02 | .005 |
| Teeth | .98 | .13 | 7.39 | < .001 |
| Unibrow | .93 | .17 | 5.40 | .001 |
| Eye-Top-Angle | .01 | .01 | 0.77 | .465 |
| Iris-Size | –.13 | .06 | –2.18 | .059 |
| Headlights on | .38 | .17 | 2.22 | .062 |
| Iris shape | 1.32 | .17 | 7.62 | < .001 |
| Confusion | .63 | .15 | 4.23 | .004 |

TABLE 4
Analysis of sensitivities for men versus women in the virtual study, unstandardized coefficients

| | Coefficients males | Coefficients females | Standard error males | Standard error females | Pooled error | *t*-test | *p* |
|---|---|---|---|---|---|---|---|
| Intercept | –1.78 | –2.72 | .68 | .74 | .22 | –4.19 | .005 |
| Mouth-Area | –.74 | –.76 | .31 | .34 | .10 | –0.17 | .741 |
| Lips | .35 | .83 | .18 | .20 | .06 | 7.91 | < .001 |
| Teeth | 1.08 | .83 | .17 | .19 | .06 | –4.34 | .004 |
| Unibrow | .88 | 1.00 | .23 | .25 | .08 | 1.56 | .129 |
| Eye-Top-Angle | .01 | –.00 | .01 | .01 | .00 | –4.02 | .006 |
| Iris-Size | –.11 | –.16 | .08 | .09 | .03 | –1.99 | .075 |
| Headlights on | .29 | .50 | .23 | .25 | .08 | 2.73 | .030 |
| Iris shape | 1.09 | 1.62 | .23 | .25 | .08 | 6.99 | < .001 |
| Asymmetry | –.18 | –.04 | .23 | .25 | .08 | 1.83 | .092 |
| Confusion | .60 | .67 | .20 | .22 | .07 | 1.07 | .237 |

## COMPARISONS

Results of the two studies were compared. Significance of variables is shown in Table 5. The results from the two studies disagreed about the shape of the mouth or air intake dam called *Frown*. One possible explanation for this difference is that the air intake dam design in actual vehicles is coincident with other mouth styling; therefore, the results were confounded. Also related to the mouth is the shape of the cheeks because as the mouth changes, the cheeks change as well. This was attempted to be captured in both studies but it was not determined to be significant in either place. An exception is discussed below related to gender.

TABLE 5
Comparison of regression *p*-values from the two studies

| Anthropomorphic variable name | Photo study *p*-value | Virtual study *p*-value |
|---|---|---|
| Iris-Size | < .001 | .060 |
| Unibrow | < .001 | .001 |
| Lips | < .001 | .005 |
| Mouth-Area | .004 | .010 |
| Eye-Top-Angle | .010 | *NS* |
| Frown | .010 | *NS* |
| Eye-Pinched | .020 | *NS* |
| Teeth | *NS* | < .001 |
| Headlights on | *NS* | .060 |
| Iris shape | *NA* | < .001 |
| Confusion | *NA* | .004 |
| Lightness | *NS* | *NS* |

*Note*. *NS* = nonsignificant; *NA* = not applicable.

The two variables, *Teeth* and *Headlights on*, were not significant in the first study but were significant in the second study. The reason for this is unknown but many possible explanations could exist such as the teeth might have been more predominantly visible in the second study. Additionally, since there were few vehicles that had the lights on or teeth in the first study, there is less statistical weight for those design modifications in the photos.

The findings in the photo study related to *Bulges* were not replicated in the virtual study. In the photo study, *Bulges* had a *p*-value of .03 for being used differently based on gender, but in the virtual study, the difference was nonsignificant. However, there is an explanation. Simulation participants commented that the graphic design of the bulges in the virtual study looked more like bags under the eyes from sorrow. In looking back at the sample vehicles in the photo study, we saw that what we measured there was more like puffed cheeks. There is much that could be said about all of these variables, but the most interesting is the difference regarding the variable *Lips*. Lips is the anthropomorphic name of the beveling of the air intake dam at the bottom of a car's front end. It is one of a few significant variables related to the mouth. Although flaring or pursing of lips is not mentioned as related to anger in Ekman and Friesen (1978), they generally mention mouth compression. It is linked to contempt which is a related emotion. In both studies, on average, women much more heavily weighted lips in evaluating whether the face looked angry. The *p*-values for this were .006 and < .001 for the photo and virtual studies, respectively. Women used lips 122% and 136% more, in the photo and virtual studies, respectively. These numbers are in very close agreement. It is clear then that women are placing more than twice as much emphasis on lips than men when interpreting anger. The effect size for the difference was $d = 1.03$, which is a large effect size. Figure B3 (see Appendix B) is an example of a vehicle that was rated as more angry by women than men, and it has more prominent lips.

Other variables had significant gender difference in the photo study (Mouth-Area, Frown, and Lightness) or virtual study (Eye-Top-Angle and Teeth) only. Like the discussion above with Bulges, this could mean that there were confounding effects in car styles.

## Patterns of Responses in Ratings

The variable *Lips* was one example of how women considered a variable more strongly than men. Many other variables showed the same pattern, but with lesser strength. A pattern was seen in both studies that men had less variation in response than women. The best evidence of this is that the multiple regression by gender produced strongly significantly different intercept values for men and women. Using the *t*-test, a *p*-value of .005 was calculated to show that the difference was significant. Despite this, men and women gave the same average response overall. This result needs to be interpreted with the understanding that these were synthetic faces, so the results may not hold true when looking at real human faces. However, it provides a chance to isolate factors related to gender difference in rating anger.

Numerous examples in both studies can be given for this phenomenon. For example, in the photo study, the vehicles were normed to the average by brand and then ratings were plotted by gender in Figure 1.

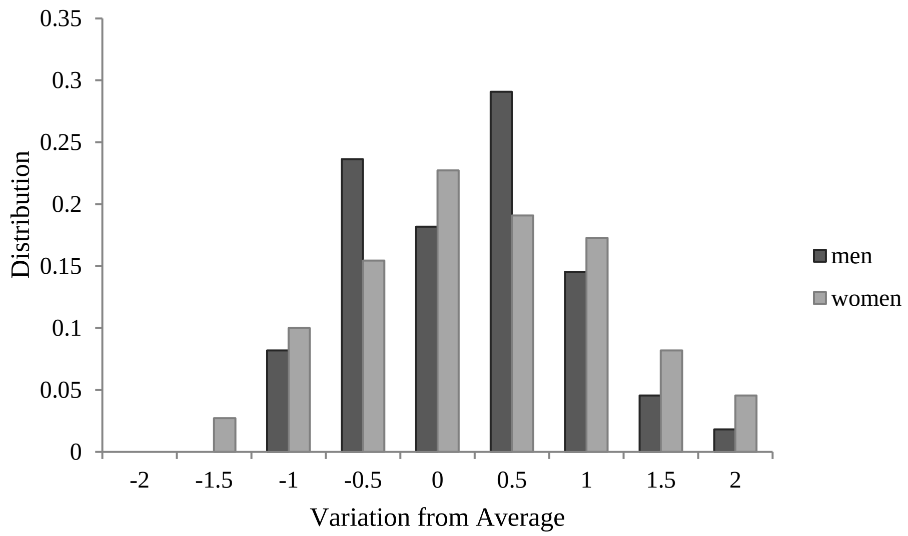


FIGURE 1
Normed brand distributions by gender. The responses from men are more central to the norm than for women.

Even though the average ratings for men and women were not statistically different, men had a smaller variance in response than women. The responses from men were lumped more toward the middle which means that men thought that the models within a brand looked relatively more the same than women did. In gender research, sometimes the variance ratio is calculated, which is the ratio of variance of men divided by women. The variance ratio for Figure 1 is .716 which indicates that women have more variance in response, so are found on the plot at the tails of the distribution. The significance of this difference had a *p*-value of .08.

### SLIDER RESULTS AND RESPONSE TIME

In Figure B3 (see Appendix B), it was shown that participants modified a feature in vehicle styling so that two options would look to have about the same level of anger. The purpose of this was to get finer control over differences between how men and women saw the faces. However, none of the 33 screens produced a significant difference with one exception.

Interestingly, there was a small but significant difference in perceived anger between men and women on screens that emphasized lips. Women still valued the air dam detail more than men even if the difference was small. In pooling results from two screens which duplicated the same question, it was found that women were 3% more likely to use lips to rate vehicles, $p$ =.090. This difference of 3% is much lower than the 122% and 136% found above for lips.

To find no difference or much weakened difference between the genders could threaten the findings. Instead, meaningful interpretations of the results come from the different results. In each screen, a variable was adjusted by the slider. That process forced the participant to focus on the details being evaluated. Since men and women produced essentially the same results in this case, that means that men and women are capable of using the same processes to rate anger, but that they may have different default processes or attention to different details.

Response time was collected to check a hypothesis that respondents needed more time to produce a more refined response. The time of each response was recorded in the virtual study but was not limited. The result supports the hypothesis, but also refines it to support the explanation above that the differentiating responses are related to attention rather than ability.

The response time results were that women took an average of 0.47 seconds longer than men on the ratings, but the $p$-value for the difference was only marginally significant ($p$ = .100). Women took an average of 6.94 seconds versus men who took an average of 6.47 seconds. Half a second is enough time for a couple additional eye fixations (Greene, 2006). Therefore, women could have been acquiring more information about the graphics before making judgements about the anger.

Conversely, the differences in time for the slider screens were not significantly different for men and women. Women still used more time, but the 0.25 second difference was not significant with the average time of 10.5 seconds and the given distribution. This significance matches the pattern above that difference between genders disappeared in the slider part of the simulation. The significance also supports conclusions that, when participants were forced to focus on details of faces, differences disappeared. Therefore, differences are largely a matter of attention.

Additionally, response time was studied with the same multiple regression process as above. One goal of the study was to see if confusing detailing in the car distracted participants from accurate ratings, or made them take a longer time to respond, but this was not supported. In general, making the car look angrier using any of the above variables reduced the response time. A gender difference is seen in that when the vehicle design was made asymmetric, women took 30% more time to evaluate it than men.

From the observations about response time a hypothesis was made. In some conditions, women take more time to judge emotions which allows collection of more data and time to process them. A hypothesis that should be tested is whether men and women are more similar when the time to rate an emotion is restricted to less than the preferred time.

## SUMMARY AND CONCLUSIONS

Overall, men and women rated vehicles about the same despite using significantly different processes to reach that conclusion. Human faces normally show many simultaneous cues for an emotion, so focusing on only a set of those cues is usually sufficient to rate the emotion. Differences were found between genders for specific vehicle designs and this enabled the study of attention to those differences.

The conflicting information in synthetic faces highlights that, under normal circumstances, women are likely to take more time to consider more cues when evaluating an emotion. They produce a wider gradient of response than men. However, this is mostly a matter of attention because if all participants are forced to focus on the same facial features they produce about the same ratings of anger. It would be interesting to see if men and women would produce the indistinct responses if they were forced to rate a synthetic face in a very short time.

The two theories were considered and support was found for both. Evidence was found that women had additional processes because they were basing ratings on more information. However, when men and women were made to focus on the same information, they could produce the same results. Since men can produce the same ratings as women when their attention is drawn to the same features, the differing ratings might be from varying interest in looking at faces, not differing skill. Conversely, since women have likely spent more time looking at faces in their lives (Sax, 2017), they could have developed the skill to know to look at additional parts of the face to determine the emotion such as the lips.

There are implications for testing of men and women. This research demonstrates that individual responses can vary based on test conditions that draw attention to differing issues. Since response can be mediated by condition, it is important to maintain test conditions to replicate results. Additionally, this emphasizes how follow-up studies can have differing findings if the test conditions are not exactly replicated.

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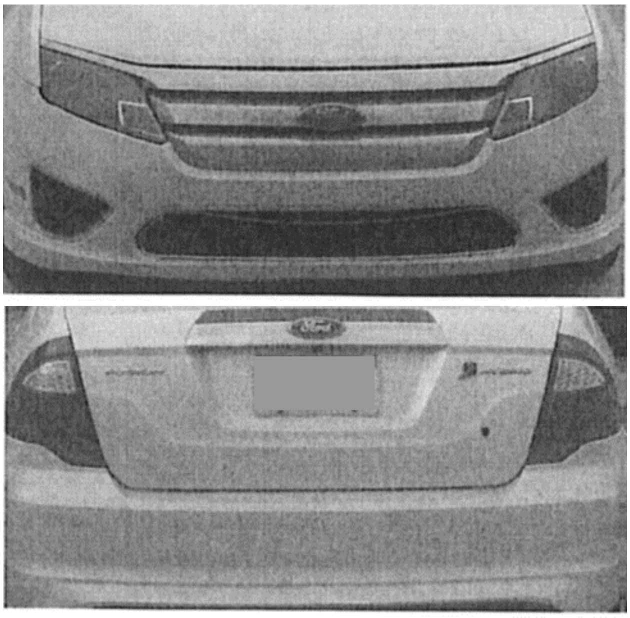
## APPENDIX A

Definitions of anthropomorphic features in vehicle design

| Anthropomorphic variable name | Definition |
|---|---|
| Iris-Size | Largest circular shape within headlamp. If no circle present, then the height of the lamp. Measured in mm when printed 3.25" wide. |
| Unibrow | A measurement of eyebrows. This is the shape of the connection between the two headlamps which is caused by the grille or lower hood detail. Arching upward (0), none (.5), flat (.9), arching downward (3). |
| Lips | Whether the air intake (mouth) has air dams, spoilers, bumper lips, or differential detailing. (Number of sides at least 2 mm thick). |
| Mouth-Area | Mouth-Width multiplied by Mouth-Height (mm × mm). |
| Eye-Top-Angle | Average slope of the top of the headlamp (degrees). |
| Frown | Shape of the air intake. Angled up (0), flat (.6), or down (2). |
| Eye-Pinched | The shape of the bottom of the headlamp on the inner half of the light. Thought to represent nose wrinkling. Convex (0), Flat (1), Concave (2). |
| Teeth | Vertical detailing in the air intake. Yes (1), No (0). |
| Headlights on | "Iris color" Whether the vehicle photo had headlights on. Yes (1), No (0). |
| Iris Shape | Odd shaped lamp in headlight. Yes (1), No (0). |
| Confusion | Whether additional car detailing were present in addition to the ones above. For example, fog lights. Yes (1), No (0). |
| Lightness | Munsel Color System's Value. (0 to 10). |
| Asymmetry | Second study only. Distortion of symmetry horizontally. Yes (1), No (0). |

APPENDIX B



a)

b)

FIGURE B1
2010 Ford Fusion.
a) front, b) back.

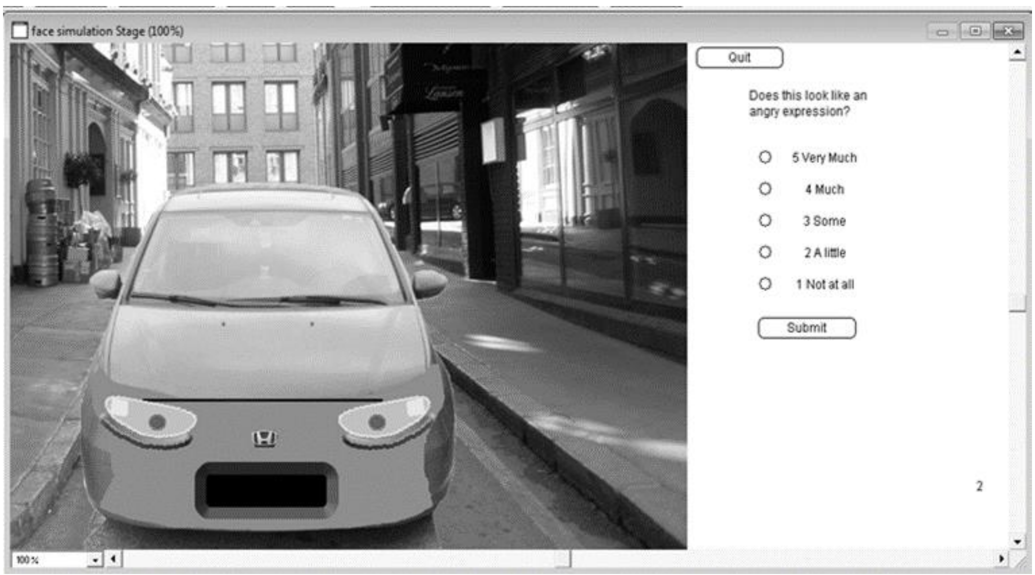



FIGURE B2
Virtual study rating input screen.

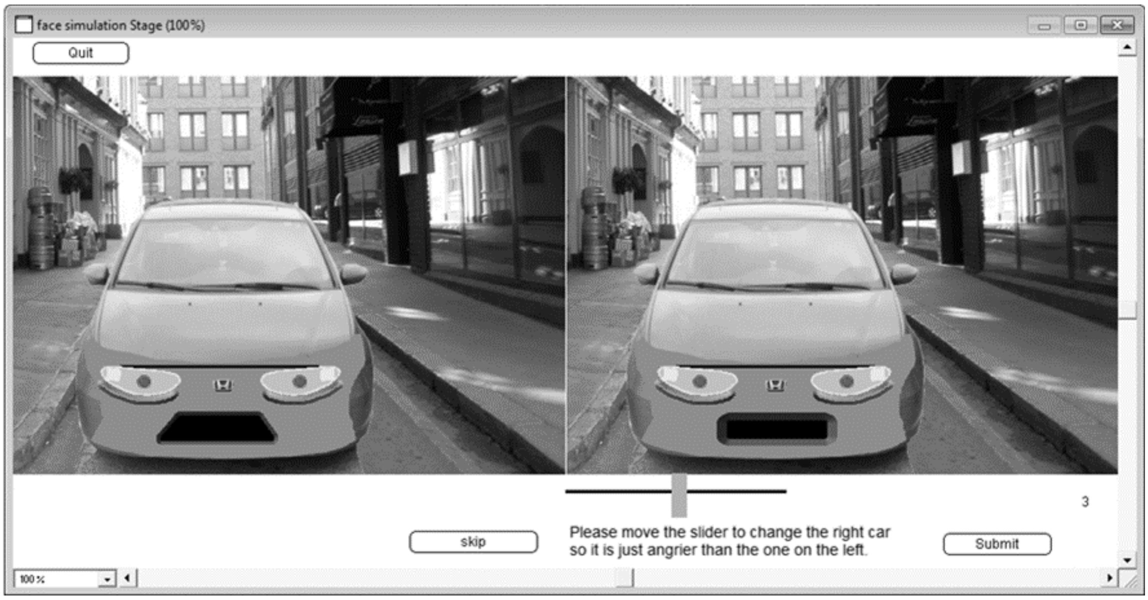



FIGURE B3
Slider comparisons.