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INFERENCES ON CRIMINALITY BASED ON APPEARANCE

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Abstract

In this research study, we tested whether people can tell if someone is a criminal based on a photograph of the person's face. The importance of the subject lies in the fact that many people are unfairly judged as criminals based on stereotypes such as race. In this study, we wished to eliminate race and see if any purely facial characteristics are stereotypically defined as criminal or if a person's initial judgment is an accurate predictor of someone's character. Extensive research has been dedicated to finding if people have facial features that portray some characteristic about them; this study will focus on criminality. Through the use of a face modulating program, neutral faced photographs were shown to participants with a question that asked if the person in the photograph is a criminal or not. The data gathered will be beneficial in either identifying facial features that are associated with criminals or that show the interesting phenomena of gut instinct.

Inferences on Criminality Based on Appearance

Past research has been conducted pointing to people's ability to make accurate inferences about personality based on appearance. The research conducted has focused on both a person's overall appearance and more specifically on which facial features affect one's perceptions of the person's personality. Though much research has focused on our ability to detect personality in general, little research has focused on a person's ability to make inferences about criminality based on appearance. The focus of our study was to determine if people can detect whether or not a person is a criminal based on appearances. The aforementioned research alludes to the detection of criminality being possible through our abilities to make personality inferences based on overall appearance and, more specifically, which facial features affect our perceptions of personality traits. Perceptions matter, so understanding the human predisposition for making judgments based on outward characteristics is important if such biases are to be taken into account in areas such as hiring processes.

Detecting Personality

Humans appear to have the striking ability to detect each other's personalities simply by looking at one another. Petrican, Todorov, and Grady (2014) tested how strangers and spouses perceived certain personality traits, such as those from the Big Five Inventory, from the participants' photographs. Researchers found that there was a high correlation between the characteristics detected by a stranger's first impression and the features identified by the same person's spouse. They had the photographed participants provide a self-evaluation and those scores corresponded with both the strangers' and the spouse's responses.

We tend to make inferences on what type of person someone is based on facial appearance. We tend to treat this person a certain way based off of this first impression. Wolffhechel et al. (2014) attempted to generate a more complete picture of the relationship between a person's facial features and how the person's personality is perceived through evaluation of a photograph. The researchers found that more attractive people were rated to have better personalities, women were rated to be more trustworthy, and men were rated to be more rationally stable (Wolffhechel et al., 2014). Others have evaluated how accurate first impressions are (Naumann, Vazire, Rentfrow, & Gosling, 2009). Researchers showed participants photographs of a person and asked them to rate the individual's character traits. When judged by the participants, characteristics such as extraversion, emotional stability, openness, and self-esteem were able to accurately be detected from the neutral position, and judgments were more accurate when the photographs were in a posed position.

Specific Facial Features Relating to Personality Traits

Research has demonstrated that specific facial characteristics as well as gender stereotypes play a part in perceptions of a person's personality attributes. Hack (2014) wanted to know whether gender played a part in a person's perceived warmth. He had participants rate faces of smiling and non-smiling males and females. He found that smiling faces on average were considered warmer than non-smiling faces. He also found that female smiling faces were perceived as warmer than male smiling faces.

Certain facial features affect people's perceptions of a person's personality characteristics more than others. Paunonen, Ewan, Earthy, Lefave, and Goldberg (1999) set out to find which facial features affected these perceptions. After using facial manipulation software, they had participants rate the untouched and

computer-edited versions of faces for different personality characteristics. The results showed that people with larger eyes give off more friendly impressions related to nurturing, honesty, likability, empathy, agreeableness, popularity, and extraversion. Smaller eyes gave impressions of masculinity, dominance, and strength. Similarly, Todorov, Baron, and Oosterhov (2008) explored how facial features may be linked to perception of one's trustworthiness. Using facial manipulation software, they edited eyebrows, cheekbones, chins, and noses, and had participants judge the trustworthiness of the edited and unedited faces. They found that low inner eyebrows, shallow cheekbones, and thin chins were perceived traits of an untrustworthy face.

Later, Flowe (2012) looked at whether a 2D face evaluation model could account for why some faces are more criminal-looking than others. Participants rated different aspects of a person pictured, such as emotional state, personality traits, and criminality. The facial expressions of the people pictured varied. Results demonstrated that angry faces were rated as appearing most criminal, then neutral, followed by happy faces. Neutral faces were also perceived as being less trustworthy if the neutral face appeared angry. The males and females who were rated high in criminal appearance were also perceived as being less trustworthy and more dominant. In conjunction with the aforementioned study, this suggests that people with low inner eyebrows, shallow cheekbones, thin chins, and small eyes give stronger impressions of anger, criminality, and untrustworthiness.

Physical Characteristics Associated with Criminals

We have discussed the accuracy of people's ability to determine others' personality traits, but often certain physical characteristics that are not facial features determine someone's impression of another person. For example, does facial hair play a significant role in influencing impression formation? Reed and Blunk (1990) focused on determining if facial hair affected others' perceptions of one's credibility, competency, and other personal attributes. They found that facial hair positively contributed to impressions of social/physical attractiveness, personality, competence, and composure (Reed & Blunk, 1990). They also found that females rated males with facial hair more positively than other males did.

Again and again we see that people tend to form their impressions of a person's character based on race, attractiveness, age, and sex, all of which can truly impact our first impressions of the people we meet. Adams et al. (2012) believed that ultimately no one sees a face as neutral, but because of certain characteristics such as race, age, and sex, a face takes on an emotional tone. In fact, characteristics

such as age, race, and sex were associated with a specific emotion that the respondents perceived from a photograph (Adams et al., 2012). Looking more closely at race, Kleider, Cavrak, and Kniycky (2012) delved into the stereotypes associated with criminality, particularly toward black males, by having participants act as casting directors. The results demonstrated that the pictures of black males with more stereotypically black features were significantly more likely to be cast as a drug dealer than pictures of white males.

Detecting Criminality

Due to the bias that exists from labeling and stereotypes, some researchers have attempted to examine whether people can accurately predict someone's criminality based on a photograph when various confounding factors are eliminated. Focusing on criminals that were white males to eliminate racial and gender bias, Thornton (1939) had participants take a test to determine what crime the person photographed had committed from a list of four. The photographs portrayed the faces of males and showed no clothing, but the researcher commented that objects such as accessories or facial hair could have influenced the results. The findings showed that there was a significant degree of correct responses as opposed to incorrect responses.

Similarly, but with some key changes, Valla, Ceci, and Williams (2011) asked participants if a person in a photograph was a criminal and if they were or were not violent. To accomplish this, the experimenters obtained photographs of criminals and non-criminals and then asked the participants to rate how likely the person shown was to be a criminal and whether the person was violent or nonviolent. In contrast to Thornton (1939), the results did not support the hypothesis that participants could tell the difference between a violent or non-violent criminal, but participants could tell the difference between a criminal and non-criminal. This study also considered the question of whether women could spot a rapist, and the answer was no.

Previous research has shown that the more detailed the questions of the experiment, the less likely that people will answer them correctly. Some of the studies had a significant degree of accuracy but others did not, which may be attributable to factors like glasses or facial hair on the person in the picture and the complicated means of answering, such as rating scales. To account for these weaknesses, in the present study we only asked if the photograph portrayed a criminal and only included stimuli featuring violent criminals and non-criminals to increase the power of the test. Along with determining whether people have the

ability to know if someone is a criminal, the data was examined to see if the gender or career path of a participant made a difference. The proposed study asked the following questions: Do people have an ability to tell if someone is a criminal simply from facial appearance? Does the gender of the participant affect the outcome? Do other characteristics of the participant, such as career choice, relate to differences in accuracy in judging criminality?

Method

Participants

The participants of the study (N = 141; Males = 70, Females = 71) were comprised of undergraduate students from a small Midwestern private university (n = 36) and a large public Western university (n = 105). We recruited participants through the use of an online participant pool management system as well as a student online newspaper and flyers. All of the participants took part on a volunteer basis but received either course credit or extra credit in a course for participating in the study.

Materials

This study required participants to complete a survey consisting of images of white males who had been convicted of a crime as well as white men who had not been convicted of a crime. Pictures of both criminals and non-criminals were obtained through the website Crime and Capital Punishment (n.d.) and through the use of photos obtained from the NimStim photo catalog (Tottenham, 2007), respectively. The questionnaire consisted of 28 total headshots of white males between the ages of 18 and 40, with no jewelry or other distinguishable markings. The criminals in the photos all had been convicted of serious, violent crimes. The photos were edited on Windows Paint to make sure that only the head was shown; all the pictures were in black and white, and were of a consistent quality. We used Google Forms to create a survey asking participants' gender, major, and university attended. Our survey on criminality inferences required our participants to simply select yes or no when asked whether the male pictured on the screen was a criminal. Each question in the survey showed one picture at a time. Example photos are shown in Figure 1.

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Figure 1. Sample images from NimStim (Tottenham, 2007).

Procedures

The survey was sent to participants through an online newsletter and information posted on flyers, and it was also made available to some via an online participant pool management system. The survey was created and administered through Google Forms, with the stimuli presented in random order. Along with each image, participants were asked the simple question, "Is this person a criminal?" Participants selected the answer "yes" or "no" for each image. Each photo was presented on a separate page.

Results

Our first objective was to find out whether people are able to detect criminality from a photograph. We measured this by looking at whether participants were more accurate than chance at determining whether an image depicted a criminal. Since our survey consisted of 28 questions with a fifty percent chance of answering correctly just by guessing, the average number of correct answers was projected to be 14 out of the 28 possible questions. A one-sample t-test demonstrated that the responses of our participants were significantly more accurate than chance, $t(139)=13.38$, $p < .01$. We later found that ten of our participants answered “no” to all questions, and two answered “yes” to all questions. We eliminated these outliers in order to have more accurate results. This increased our total mean accuracy to 18.37, $t(129)=14.25$, $p < .01$. The results of participants’ responses are illustrated in Figure 2*A* with columns for the correct and incorrect responses to criminals and

non-criminals. From this, we conclude that people seem to have the ability to detect criminality based on facial features.

Our second objective was to find whether participant attributes such as gender, career path, and school attended affected accuracy. We measured career path by separating participants into two broad categories: social science majors versus non-social science majors. After running three separate independent-group t-tests for gender, career path, and school attended, we found that there were no significant differences between the groups in their ability to detect criminality ($p > .05$). After eliminating outliers and retesting, we still found no significant differences between groups of participants.

We found that the average accuracy score for detecting criminals was 8.3 out of the total fourteen criminals. The accuracy of predictions for each criminal photograph is illustrated in Figure 2*B*. This is significantly greater than chance, which would have predicted 50 percent accuracy (seven out of fourteen criminals), $t(128) = -14.87$, $p < .05$. The average accuracy score of non-criminals was 10.1 out of the possible fourteen, $t(128) = -21.33$, $p < .05$. Figure 2*C* illustrates the accuracy of participants' responses for each photograph of the non-criminals. It makes sense that identification of non-criminals was more accurate than identification of criminals as participants were more likely to label the person pictured as a non-criminal. Fifty-six percent of the total answers from the survey were "no," indicating that participants were more likely to believe that the image depicted a non-criminal than a criminal. We expand on this in the discussion section.

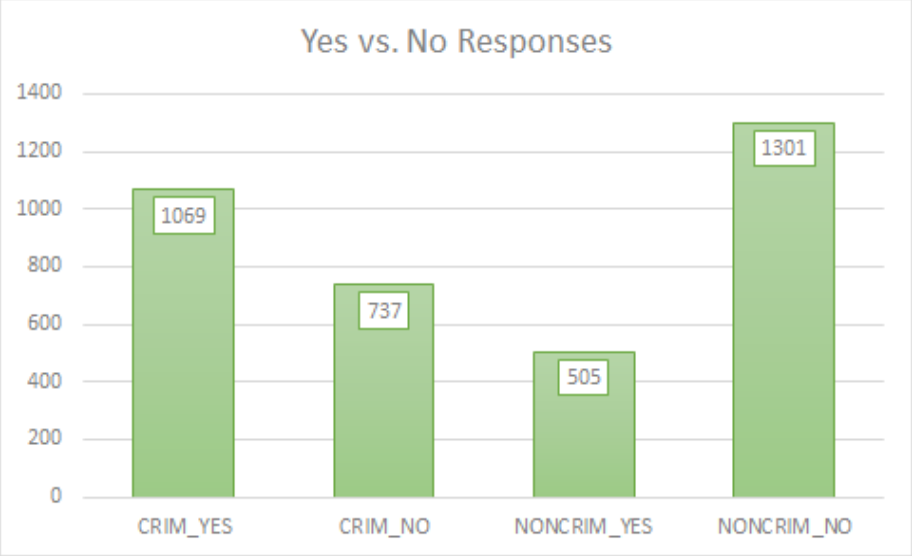

Figure 2A. Shows the number of people who correctly answered “yes” to the photograph of a criminal or “no” to the photograph of a noncriminal and those with incorrect responses of “no” to the photograph of a criminal and “yes” to the photograph of a noncriminal.

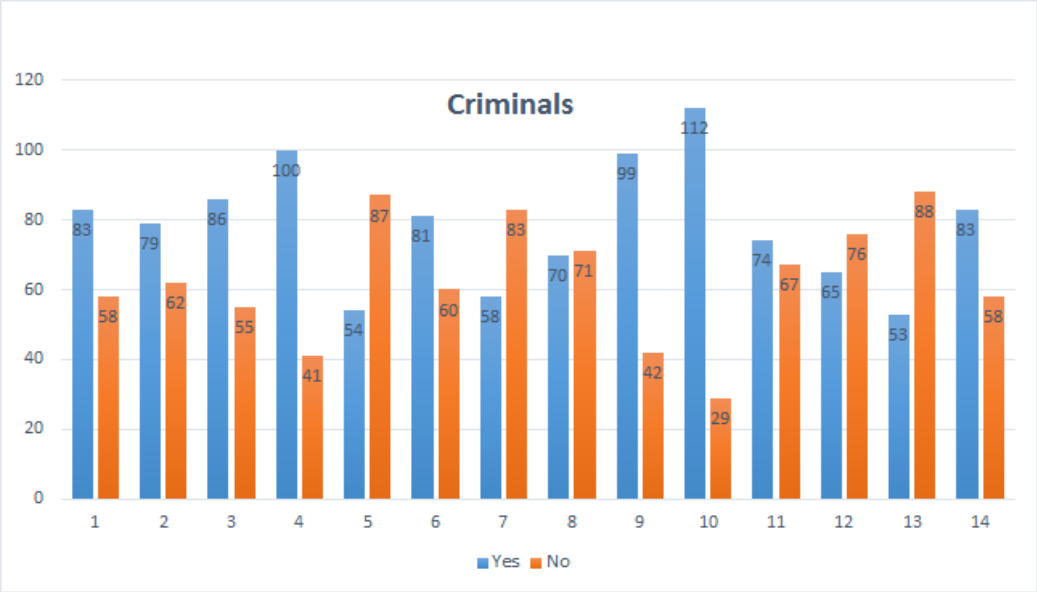

Figure 2B. Illustrates the "yes" and "no" responses to specific criminal photographs used in the questionnaire.

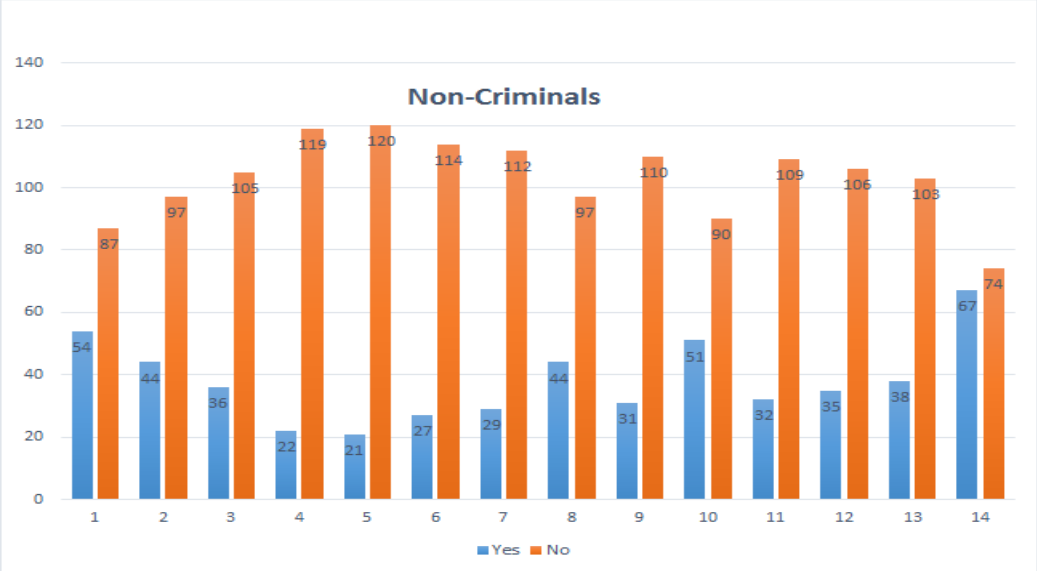

Figure 2C. Illustrates the "yes" and "no" responses to the specific photographs of non-criminals used in the questionnaire.

Discussion

It would appear from our results that people can indeed identify criminals' facial features with a level of accuracy greater than chance. We also looked at whether gender and career choice of the participant played a role in the perception of a criminal. Our subject pool was divided into social sciences and non-social sciences. Neither gender, career choice, nor institutional affiliation had an effect on the number of correct responses. So, our original research question asking if people are able to determine whether someone is a criminal based on facial appearance is supported. Our second research question, asking if other participant characteristics make a difference in accuracy levels, showed no effect regarding the characteristics we examined.

From past research, we have seen that certain characteristics such as extraversion, self-esteem and openness have been found to be detectable with accuracy based on facial features (Naumann et al., 2009). We have also seen that certain characteristics (e.g., race, presence of a beard or shaggy hair) have been found to influence others' views of who that person is (Reed & Blunk, 1990). From research, we consistently see that people can accurately make inferences regarding who someone is simply by looking at a face.

More specifically, for nearly eight decades there has been evidence that people can distinguish between criminals and non-criminals (Thornton, 1939). When participants were shown pictures of criminals or non-criminals and asked which was which, it was found that participants were correct more often than they were incorrect. This coincides with the findings from our research showing that, with greater-than-chance accuracy, people are able to detect criminality based on facial features alone. Other research, as discussed in our earlier review of the literature, supports what our study concluded.

We found that participants were more likely to say someone was not a criminal rather than a criminal. Figures 2B and 2C illustrate this bias. In Figure 2C, we see that participants were significantly more inclined to answer no than yes. In Figure 2B, the answers were much more even. So, it seems that people are predisposed toward judging a person as a non-criminal, even in ambiguous circumstances.

There were a number of limitations to our study. One limitation was our participants and how seriously they took the survey. We found after taking a closer look at our statistics that some people exclusively answered yes or no to every question. We can interpret this in multiple ways; perhaps these participants truly

thought all were criminals or all were not criminals, or perhaps they just clicked through the survey to get it over with. Either way, we chose to exclude these answers from our final statistics to ensure accuracy of our findings. We did not specify how many of our stimuli depicted criminals. Specifying the ratio of criminals to non-criminals could potentially affect responses by letting participants know that there is indeed a mixture of criminals and non-criminals. We were not able to manipulate facial features in the images, which is limiting because it did not allow us to determine which facial features led to our participants determining the person pictured as a criminal or non-criminal. Past research has shown that certain features are perceived as less trustworthy than others (Flowe, 2012). We did not control for such features in our study, but performing such manipulations would provide interesting insight for future research. Finally, the external validity of our study is limited due to the fact that we limited our participants to college students and our stimuli to head shots of white males. However, this choice was made to increase internal validity.

In sum, we have concluded that we indeed can determine if someone is a criminal or not based on facial features with accuracy levels greater than chance; however, there is still a substantial amount of error involved. Future research may look into aspects of the entire look of a person instead of just the face. Furthermore, researchers should explore specific facial features that are most likely to influence perceptions of criminality. Overall, the most important conclusion from this study is that we have some ability to accurately infer others' characteristics and even criminality based on facial characteristics. However, we should not go around labeling people based on their looks, as the amount of error involved in making such judgments is substantial.

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