

Facial Trustworthiness Predicts Extreme Criminal-Sentencing Outcomes



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Psychological Science

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DOI: 10.1177/0956797615590992

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Abstract

Untrustworthy faces incur negative judgments across numerous domains. Existing work in this area has focused on situations in which the target's trustworthiness is relevant to the judgment (e.g., criminal verdicts and economic games). Yet in the present studies, we found that people also overgeneralized trustworthiness in criminal-sentencing decisions when trustworthiness should not be judicially relevant, and they did so even for the most extreme sentencing decision: condemning someone to death. In Study 1, we found that perceptions of untrustworthiness predicted death sentences (vs. life sentences) for convicted murderers in Florida ($N = 742$). Moreover, in Study 2, we found that the link between trustworthiness and the death sentence occurred even when participants viewed innocent people who had been exonerated after originally being sentenced to death. These results highlight the power of facial appearance to prejudice perceivers and affect life outcomes even to the point of execution, which suggests an alarming bias in the criminal-justice system.

Keywords

face perception, judgment, physical appearance, social perception, legal processes, open data, open materials

Received 12/10/14; Revision accepted 5/21/15

People infer trustworthiness from faces quickly and with high consensus (Krumhuber et al., 2007; Willis & Todorov, 2006; Zebrowitz, Voinescu, & Collins, 1996). Yet despite wide agreement over which faces look trustworthy and which do not, there is little evidence that perceptions of individuals' trustworthiness predict how they behave (Rule, Krendl, Ivcevic, & Ambady, 2013). Even when trust-diagnostic behavioral information is available, people continue to be swayed by perceptions of trustworthiness from faces (Rudoy & Paller, 2009; Todorov & Olson, 2008). Thus, facial trustworthiness not only affects perceivers' impressions of others, but it can also influence targets' life outcomes in meaningful ways because of psychological biases in perception.

Indeed, people who appear untrustworthy are less likely to be trusted. For example, players in the trust game invest less money with partners who look less trustworthy—even as early as 5 years of age (Ewing, Caulfield, Read, & Rhodes, 2015). Moreover, these biases persist despite information demonstrating that the targets are actually trustworthy (Rezlescu, Duchaine, Olivola, & Chater, 2012; van't Wout & Sanfey, 2008). People therefore

show less trust in those who appear untrustworthy, and this affects what should otherwise be rational economic decisions (Henrich et al., 2001).

Perhaps more illustrative, facial trustworthiness affects decisions about guilt in court. People whose appearance seems congruent with an alleged crime are more often thought guilty than those whose appearance evokes incongruent stereotypes (Berry & Zebrowitz-McArthur, 1988; Macrae & Shepherd, 1989; Shoemaker, South, & Lowe, 1973; Zebrowitz & McDonald, 1991). Similarly, people whose faces look less trustworthy are judged guilty on the basis of less evidence in hypothetical crime vignettes (Porter, ten Brinke, & Gustaw, 2010).

Most prior studies have focused on imaginary crime scenarios, typically using faces of people not actually suspected of crimes (e.g., Dumas & Testé, 2006). Thus, despite the consistent link between perceived trustworthiness and

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perceived guilt, little is known about how facial trustworthiness affects real-world criminal-justice outcomes. Here, we examined how facial trustworthiness influences the actual sentencing of convicted murderers. This work has the potential to address two critical issues: whether facial trustworthiness biases decisions even when trust is irrelevant (e.g., when the target person will never have the chance to commit further crimes outside of prison) and whether facial trustworthiness affects criminal sentencing in its most extreme form (i.e., in sentencing convicted murderers to death vs. life in prison). Following previous work showing that psychological biases affect what should otherwise be impartial decisions, particularly for trustworthiness (e.g., Ewing et al., 2015), we hypothesized that the perceived trustworthiness of individuals' facial appearance would affect the verdicts they received.

Previous work has shown that appearance-based cues to race can also affect criminal sentencing. Eberhardt, Davies, Purdie-Vaughns, and Johnson (2006) found that Black defendants who looked more stereotypically Black were more likely to be sentenced to death than Black defendants who looked less stereotypical. In related work, Blair, Judd, and Chapleau (2004) showed that an Afrocentric appearance predicted longer sentences for both White and Black defendants. Thus, to refine our test of the role of trustworthiness in criminal sentencing, we investigated how other appearance traits related to legal outcomes, such as Afrocentricity, attractiveness (Stewart, 1980), and facial maturity (Berry & Zebrowitz-McArthur, 1988), may affect criminal-sentencing outcomes.

We additionally accounted for facial features associated with aggression. Perhaps unsurprisingly, aggression has been linked to a propensity for violent crime (Berkowitz, 1962). More pertinent, facial width-to-height ratio (fWHR) positively predicts aggressive behavior in men (Carré, McCormick, & Mondloch, 2009). Perceivers appear sensitive to this, as they are less likely to trust partners with greater fWHR in economic games (Stirrat & Perrett, 2010). Indeed, fWHR moderately correlates with perceptions of trustworthiness (Stirrat & Perrett, 2010). Thus, given that fWHR significantly corresponds to actual and perceived aggression, we wanted to control for its influence. An independent effect of perceived trustworthiness would therefore discourage the possibility that facial cues to aggressive behavior account for trustworthiness-based biases in criminal sentencing.

We used one primary methodology to assess the relationship between facial trustworthiness and actual criminal sentences across two studies. Specifically, we gathered the faces of convicted murderers who had been sentenced to either death or life in prison. In Study 1, we compared the facial trustworthiness of every death-row inmate in Florida with a matched group of convicted murderers serving life sentences in the same state. Then,

in Study 2, we collected images of people exonerated for prior murder convictions from a database maintained by the Innocence Project (see Scheck, Neufeld, & Dwyer, 2001) and related impressions of their trustworthiness to the severity of their original sentences. Critically, these postexoneration images depicted innocent people no longer in prison. In each study, we hypothesized that individuals who look less trustworthy would receive harsher sentences, even when they had committed no crime. Such results would demonstrate that overgeneralizations of facial cues beyond more judicially relevant information can yield extreme consequences even for low-fidelity perceptions, such as trustworthiness, and in contexts specifically structured to combat subjective bias.

Study 1

In Study 1, we collected photographs of inmates currently incarcerated by the Florida Department of Corrections. We used the State of Florida's database because it is thorough and publicly available, and because all death-row inmates are collected in a single roster. We thus investigated the relationship between facial trustworthiness and sentencing among real criminals presently serving life sentences or awaiting execution.

Method

Stimulus selection. We selected all of the 376 White and Black males from the entire population of 394 inmates on death row in Florida as of October, 2014. This resulted in the exclusion of 5 female inmates and 13 inmates of other races, as we wished to keep sex uniform and to include target race as a factor in our model in light of previous research (Blair et al., 2004; Eberhardt et al., 2006). From the selected targets, we further excluded 5 inmates whose race appeared to conflict with the information provided (based on the consensus racial categorizations of two research assistants). This left us with 371 total inmates on death row (226 White, 145 Black).

We then selected a group of male inmates convicted of first-degree murder and sentenced to life imprisonment to serve as a control group. We selected these inmates by searching the database according to race and downloading the photographs of the first 226 White and 145 Black inmates (organized alphabetically by last name) to match the death-row targets on race, without regard for any other visual characteristics.¹ Because of this matched selection, it was not possible for race to predict sentencing outcomes in the present study, as there were equal numbers of Black and White targets in each of the death-row and life-imprisonment groups.

Our search resulted in a final database of 742 images, half of which depicted inmates on death-row and half of

which depicted inmates sentenced to life in prison. We converted these images to gray scale to control for possible differences in lighting and to obscure color cues from visible portions of the inmates' uniforms, which differed for inmates on death row (orange vs. the standard blue).

Trait ratings. We divided the 742 images into seven sets of similar size (94–108 photos each). There were an equal number of targets sentenced to life and sentenced to death within each set, and the racial split was also even within these groups (e.g., participants viewing 33 White and 21 Black targets sentenced to life would also view 33 White and 21 Black targets sentenced to death).

We obtained trustworthiness ratings for all seven sets by asking each of 208 American workers from Amazon Mechanical Turk (101 male, 107 female; mean age = 35.0 years, $SD = 12.0$) to rate the trustworthiness of the faces from one randomly selected set on a scale from 1 (*not at all trustworthy*) to 8 (*very trustworthy*). We analyzed the interrater reliability of the trustworthiness ratings within each of the seven groups, which reached acceptable levels (all Cronbach's α s > .72).

We also recruited separate samples to rate the same seven sets of targets for Afrocentricity ($N = 141$ raters; 82 male, 59 female; mean age = 32.9 years, $SD = 11.0$), attractiveness ($N = 140$ raters; 90 male, 50 female; mean age = 33.2 years, $SD = 10.2$), and facial maturity ($N = 140$ raters; 85 male, 55 female; mean age = 33.3 years, $SD = 13.0$); all sample sizes were estimated to achieve acceptable levels of interrater reliability (all Cronbach's α s \geq .80). Research assistants coded targets for the presence of glasses ($n = 115$ targets) and visible (face or neck) tattoos ($n = 14$ targets). We believed that it was important to include these traits in the context of previous findings linking Afrocentricity (Blair et al., 2004; Eberhardt et al., 2006), attractiveness (Sigall & Ostrove, 1975; Stewart, 1980), and facial maturity (Berry & Zebrowitz-McArthur, 1988) to criminal sentences and because glasses and tattoos can meaningfully influence the perception of faces (Funk & Todorov, 2013; Hellström & Tekle, 1994). Because Afrocentricity ratings were distributed bimodally according to race, we normalized the distribution of values within the White and Black targets.

Finally, we measured the fWHR of each target using methods from previous studies (Carré & McCormick, 2008). We again divided the faces into seven groups and asked two independent research assistants to measure each face using ImageJ, an open-source program available from the National Institutes of Health. Within each group, interrater reliability was high (Cronbach's α s \geq .85); we therefore averaged the pair of measurements for each face. Trustworthiness ratings and fWHR showed a small negative correlation, Spearman's $r(740) = -.12$,

$p = .001$, which suggests that although they were related to one another, they were largely independent.

Results

Because we were interested in generalizing about the characteristics of the targets (e.g., how perceptions of their trustworthiness relate to their sentences), we analyzed the data with the target as the unit of analysis. We therefore averaged the participants' ratings to compute mean consensus judgments for each face on each trait. Degrees of freedom thus reflect the number of faces, rather than the number of participants contributing to judgments of those faces.

Mean analyses. To investigate whether trustworthiness differed according to sentence and target race, we first subjected the mean trustworthiness data for each of the 742 targets to a 2 (race: Black vs. White) \times 2 (sentence: life vs. death) between-targets analysis of variance (ANOVA). We observed a main effect of sentence, $F(1, 738) = 7.44, p < .01, \eta_p^2 = .01$; targets sentenced to death looked less trustworthy ($M = 2.76, SE = 0.03$) than targets sentenced to life imprisonment ($M = 2.87, SE = 0.03$), 95% confidence interval (CI) for the difference = [0.03, 0.20]. We also observed an unpredicted main effect of race, $F(1, 738) = 47.67, p < .001, \eta_p^2 = .06$; Black targets were rated as more trustworthy ($M = 2.96, SE = 0.03$) than White targets ($M = 2.67, SE = 0.03$), 95% CI for the difference = [0.21, 0.37] (see the Supplemental Material available online for further discussion). Notably, race and sentence did not interact, $F(1, 738) = 0.02, p > .88, \eta_p^2 < .001$, which suggests that the relationship between trustworthiness and sentence was not moderated by target race. For this reason, we did not compute an interaction term involving race for the subsequent regression analyses.

Logistic regression. We next built a logistic regression model to assess the extent to which facial trustworthiness predicted sentencing outcomes in the presence of the other traits that we measured. We regressed sentence outcome (0 = life, 1 = death) onto trustworthiness in Step 1 of a binary logistic regression model and entered the covariates (Afrocentricity, attractiveness, facial maturity, fWHR, presence of glasses, and presence of tattoos) in Step 2.

The primary model accounted for significantly more variance than the simple intercept model, $\Delta\chi^2(1) = 7.52, p < .006$. Recapitulating the ANOVA results, Model 1 showed that trustworthiness predicted sentencing outcomes, $b = -0.36, SE = 0.13, p = .007$, odds ratio = 0.70, 95% CI for the odds ratio = [0.54, 0.91]; targets perceived as less trustworthy were more likely to be sentenced to death. Adding the covariates in Step 2 improved the

Table 1. Results of the Logistic Regression Analysis Predicting Sentence Outcome (Life = 0, Death = 1) in Study 1

Predictor	<i>b</i>	Odds ratio
Model 1		
Trustworthiness	-0.36** (0.13)	0.70 [0.54, 0.91]
Intercept	0.99 (0.37)	2.69
Model 2		
Trustworthiness	-0.41** (0.15)	0.67 [0.50, 0.89]
Afrocentricity	-0.24** (0.08)	0.79 [0.67, 0.92]
Attractiveness	-0.16 (0.14)	0.85 [0.64, 1.12]
Facial maturity	-0.14 (0.09)	0.87 [0.73, 1.04]
Facial width-to-height ratio	0.33*** (0.08)	1.39 [1.18, 1.63]
Presence of glasses	0.45* (0.22)	1.57 [1.02, 2.40]
Presence of tattoos	-0.55 (0.56)	0.58 [0.19, 1.72]
Intercept	2.19 (0.81)	8.89

Note: Standard errors are given in parentheses; 95% confidence intervals are given in brackets. The fit of Model 1 was good, $\chi^2(1) = 7.52$, $p = .006$, but Model 2 explained more variance, $\chi^2(7) = 41.67$, $p < .001$; $\Delta\chi^2(6) = 34.15$, $p < .001$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

model, $\Delta\chi^2(6) = 34.15$, $p < .001$, and trustworthiness remained a significant predictor of the death sentence, $b = -0.41$, $SE = 0.15$, $p = .005$, odds ratio = 0.67, 95% CI for the odds ratio = [0.50, 0.89]. Along with trustworthiness, Afrocentricity was negatively associated with the death sentence (see the Supplemental Material for a discussion), and fWHR and the presence of glasses were positively associated with the death sentence. The coefficients for the covariates are presented in Table 1.

Discussion

Using a comprehensive sample of 371 death-row inmates and matched targets sentenced to life imprisonment, we found that people who look less trustworthy were more often sentenced to death for first-degree murder. This relationship emerged even in the presence of other important variables, including fWHR—a pubertally determined structural property of faces (Weston, Friday, & Liò, 2007) that has been associated with aggression (Carré et al., 2009). The independence of trustworthiness and fWHR is perhaps understandable. For example, recent work showed that explicit trustworthiness ratings diverged from trust behaviors toward the same targets, which suggests some modularity between perceptions of trustworthiness and related variables (Bonnefon, Hopfensitz, & De Neys, 2013).

However, some questions remain. Previous research has shown that fWHR may be associated with both perceived trustworthiness and actual aggressive behavior (Carré et al., 2009). Although the effect of trustworthiness

occurred independently of fWHR, might it be that convicted criminals who look less trustworthy are actually more violent and therefore deserve harsher sentences? To address this possibility, we investigated the relationship between facial trustworthiness and sentencing outcomes among former prisoners falsely convicted of crimes in Study 2. Should these innocent targets show a relationship similar to that in Study 1, it would suggest that individuals who look less trustworthy receive harsher sentences because of their facial appearance, not their behavior.

Study 2

Given the same crimes, people who look less trustworthy get harsher sentences than people who look more trustworthy. Moreover, people with greater fWHR (a correlate of aggression) are independently more likely to receive the death penalty, which thus makes it unlikely that death-row inmates might look different than inmates sentenced to life because their time on death row has altered their appearance. Perhaps individuals who look less trustworthy commit their crimes in a more heinous manner and are thus more culpable. To test this possibility, we examined the relationship between perceived trustworthiness and criminal sentencing among innocent individuals in Study 2. Specifically, we collected photographs from the Innocence Project of people previously convicted of murder but subsequently exonerated, most often on the basis of DNA evidence. If facial appearance predicts criminal sentencing among a cohort of entirely innocent people, it would corroborate that facial trustworthiness biases judicial outcomes.

Method

Stimulus selection. We collected information for every person listed on the Innocence Project Web site as of October 2014, whose biographical profile contained a photograph. From these profiles (all of which were for men), we recorded whether each person had received a sentence of life imprisonment or worse, how long he served, the crime he committed, the year of conviction, and in which state the conviction occurred. This resulted in a corpus of 107 targets. From this list, we eliminated any person who lived in a state in which the death sentence is not administered. We further selected only targets whose crimes would have made them eligible for the death sentence in their states. We arrived at a final set of 37 targets: 20 sentenced to life and 17 sentenced to death. Of these targets, 20 were Black and 17 were White or Hispanic.² We cropped the photos to show just the faces and converted them to gray scale, as in Study 1.

Table 2. Results of the Logistic Regression Analysis Predicting Sentence Outcome (Life = 0, Death = 1) in Study 2

Predictor	<i>b</i>	Odds ratio
Model 1		
Trustworthiness	-1.55* (0.68)	0.56 [0.06, 0.80]
Intercept	5.96 (2.71)	387.72
Model 2		
Trustworthiness	-1.47 [†] (0.78)	0.23 [0.05, 1.06]
Afrocentricity	-0.51 (0.41)	0.60 [0.27, 1.34]
Attractiveness	-0.30 (0.86)	0.74 [0.14, 3.98]
Facial maturity	0.16 (0.53)	1.18 [0.41, 3.32]
Presence of glasses	1.14 (1.01)	3.11 [0.43, 22.66]
Time served	-0.14 (0.08)	0.87 [0.75, 1.01]
Intercept	7.49 (4.58)	1,780.52

Note: Standard errors are given in parentheses; 95% confidence intervals are given in brackets. The fit of Model 1 was good, $\chi^2(1) = 6.47$, $p = .01$, but adding the covariates in Model 2 did not improve its fit, $\Delta\chi^2(5) = 6.04$, $p = .30$, and the full model was only marginally significant, $\chi^2(6) = 12.51$, $p = .051$.

[†] $p = .06$. * $p < .05$.

Trait ratings. We recruited American workers from Amazon Mechanical Turk to rate each of the 37 targets for trustworthiness ($N = 39$ raters; 21 male, 18 female; mean age = 36.1 years, $SD = 12.6$), Afrocentricity ($N = 30$ raters; 13 male, 17 female; mean age = 35.3 years, $SD = 11.9$), attractiveness ($N = 22$ raters; 9 male, 13 female; mean age = 34.0 years, $SD = 10.0$), and facial maturity ($N = 22$ raters; 14 male, 8 female; mean age = 38.0 years, $SD = 14.3$) using the same scales as in Study 1 (all Cronbach's α s for interrater reliability $\geq .80$). We again coded each target for the presence of glasses ($n = 11$) and tattoos ($n = 0$) but were unable to measure fWHR in these faces, as the targets were not uniformly facing the camera.

Results

We once again built a logistic regression model to assess the extent to which facial trustworthiness predicted sentencing outcomes while covarying Afrocentricity, attractiveness, facial maturity, the presence of glasses, and the number of years each target served in prison. We regressed sentence outcome (0 = life, 1 = death) on trustworthiness in Step 1 of a binary logistic regression model. We entered all other covariates (Afrocentricity, attractiveness, facial maturity, the presence of glasses, and time served) in Step 2. As in Study 1, the primary model accounted for significantly more variance than the simple intercept model, $\Delta\chi^2(1) = 6.47$, $p = .01$. Trustworthiness significantly predicted sentencing outcomes, $b = -1.55$, $SE = 0.68$, $p = .02$, odds ratio = 0.21, 95% CI for the odds ratio = [0.05, 0.80]; faces perceived as less trustworthy were more likely to be sentenced to death. In this study, the addition of the covariates in Step 2 did not improve

the model, $\Delta\chi^2(5) = 6.04$, $p = .30$, and none of the covariates predicted the death sentence. However, trustworthiness continued to show an effect, albeit one that was marginally significant in this nonsignificant model, $b = -1.47$, $SE = 0.78$, $p = .06$, odds ratio = 0.23, 95% CI for the odds ratio = [0.05, 1.06]. The coefficients for all covariates are presented in Table 2.

Discussion

Trustworthiness again predicted the sentences of convicted murderers eligible for the death penalty. Remarkably, this relationship emerged even though we used photos of innocent people exonerated of their crimes. Additionally, these photographs were not incarceration photos, which shows that results were consistent across photos from different sources. We also statistically accounted for how long each individual was incarcerated, which diminishes the possibility that the relationship between facial trustworthiness and sentence outcomes may be magnified by the effect of prison conditions on appearance. Thus, facial appearance affects real-world criminal sentencing independently of actual guilt.

General Discussion

Across two studies, we found evidence that legal authorities overgeneralized facial trustworthiness past judicially relevant behavioral information to disproportionately sentence targets who looked untrustworthy to the ultimate legal punishment: execution by the state. This relationship remained consistent even when we controlled for other relevant perceptions (including facial maturity and attractiveness) and objective morphological characteristics of the face (fWHR). Thus, perceptions of trustworthiness from faces, which have high consensus but questionable validity with regard to actual behavior (e.g., Rule et al., 2013), affect criminal sentencing. These findings join those of other research on the role of facial information in criminal sentencing (e.g., Blair et al., 2004; Eberhardt et al., 2006; Porter et al., 2010) to paint a somewhat alarming picture of how systems of legal punishment are vulnerable to the same biases in person perception that afflict everyday individuals. Even further, we have shown that both subjective and objective measurable facial characteristics can yield this bias in devastating ways. Thus, people who look less trustworthy receive harsher criminal sentences, and overgeneralization of traits from their faces appears to be responsible for this effect.

Although it is possible that people who look less trustworthy commit more odious crimes, we found evidence for sentencing biases based on facial trustworthiness even among targets exonerated of the crimes for which they were convicted. This shows compelling evidence for

the ability of facial appearance to guide the severity of sentencing decisions. These data, along with the fWHR data from Study 1, also help to dispel the possibility that sitting on death row causes one's appearance to look less trustworthy (as through negative affect or hopelessness), given that the photos in Study 2 were not incarceration photos but were taken after exoneration.

This research has important implications for the influence of personal appearance on high-impact judgments. Put simply, one's face may determine one's fate, at least in the judicial domain. This was especially striking here, as it occurred in the sentencing phase after guilt had been determined and for people who will never leave prison. More research is needed to determine the process by which appearance influences criminal outcomes and to solidify the causal structure of this relationship. For example, appearance could bias judges' and juries' perceptions of the severity of the crime, of the threat posed by the perpetrator, or of the perpetrator's degree of remorse, among other potential factors. Any of these would suggest a concerning degree of overgeneralization of facial information, given the severity of the outcome. Regardless of the specific nature of the process, the current research provides clear evidence of a link between facial traits and criminal sentences based on characteristics that otherwise have low predictive validity for behavior. These data therefore support previous theoretical models illustrating the biasing nature of first impressions on behavior (e.g., Bonnefon, Hopfensitz, & De Neys, 2015). Moreover, given the wide latitude and subjectivity that justices express in capital crimes (Williams, 2014), it is critical that researchers, policymakers, and legal professionals are aware of this relationship and the potential biases that it entails.

Author Contributions

J. P. Wilson developed the study concept, conducted testing, and collected the data. J. P. Wilson analyzed and interpreted the data with feedback from N. O. Rule. J. P. Wilson drafted the manuscript, and N. O. Rule provided critical revisions. Both authors approved the final version of the manuscript for submission.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Funding

This research was funded by the Social Sciences and Humanities Research Council of Canada.

Supplemental Material

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Notes

1. To address the possibility that the alphabetical ordering of the control stimuli may not have been sufficiently random, we collected a second set of control targets serving life sentences for first-degree murder. We matched each life-imprisonment target to a death-row target by age in addition to race from randomly selected pages of the alphabetically organized offender database. Research assistants conducted searches filtered by age and picked a results page from the beginning, middle, or end of the alphabet, alternating with each search. They then selected as many targets as necessary to match the number of death-row targets for each age. There was no overlap in the life-imprisonment targets between the two sets, and trustworthiness predicted death sentences with similar magnitude as in the original set, $b = -0.67$, $SE = 0.15$, $p < .001$, odds ratio = 0.51, 95% confidence interval (CI) for the odds ratio = [0.38, 0.69].
2. Race was not associated with trustworthiness in this sample. In a 2 (race: Black vs. White) \times 2 (sentence: death vs. life) between-targets ANOVA, we observed only a main effect of sentence on trustworthiness, $F(1, 33) = 5.33$, $p = .03$, $\eta_p^2 = .14$. Race did not predict trustworthiness, $F(1, 33) = 0.15$, $p = .46$, $\eta_p^2 = .02$, nor did it interact with sentence, $F(1, 33) = 0.03$, $p = .88$, $\eta_p^2 = .001$.

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