Original Article:

IN THE SHADOW OF DOUBT: THE IMPACT OF A DEFENDANT'S IDENTITY ON JURORS' PERCEPTION OF DNA EVIDENCE IN MURDER CASES

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Abstract

The current study explored how intersectional identities of race/ethnicity and religion of a defendant can impact the mock jurors' decisions in a murder case with different types of DNA evidence. Five hundred thirty-eight subjects were randomly assigned a murder case that varied in the defendant's demographics (religion and race/ethnicity), as well as the type of DNA evidence presented. Each participant answered questions about the verdict, sentencing, perceptions of the evidence and the defendant. A 5 (Defendant's race/ethnicity: White/Black/Arab/Latino/Asian) x 2 (Religious identification: Christian/Muslim) x 3 (DNA evidence presented: consistent/inconsistent/inconclusive) between-subjects ANOVA was performed. Mock jurors felt more confident in their verdict for the Black Muslim rather than Black Christian defendant. When the DNA evidence was inconclusive, mock jurors perceived the evidence for the Arab Christian to be more reliable when compared to White and Black Christian defendants. Mock jurors perceived the inconclusive DNA evidence for the Latino Christian and Asian Christian defendants as more reliable when compared to the Black Christian defendant. When the DNA was inconclusive, mock jurors perceived it to be more reliable for the Black Muslim rather than Black Christian defendant. This demonstrated bias towards a defendant based on their race/ethnicity and religion.

Keywords: juror decision-making, race/ethnicity, religion, DNA evidence

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INTRODUCTION

The American Bar Association (2019) defines a jury as a group of people who "represent a cross-section of the community" and who determine the truth of a case based on its facts during trial. Though the judge decides the sentencing and hears the case, the jurors are the only people to weigh the facts and choose whether a defendant is "guilty" or "not guilty" by majority (American Bar Association, 2019). According to Curley et al. (2022), jury bias can be defined as a "factor that produces a preference toward a certain outcome" - that being acquittal or conviction of a defendant. Bias can permeate a juror's decisions in ways such as: (1) beliefs and attitudes felt toward the defendant prior to trial, (2) cognitive biases that come from related experiences, and (3) interpretations of evidence given by an expert witness, which may also be biased (Curley et al., 2022). Pretrial publicity is also a risk for jury bias when entering the courtroom at a later time and has demonstrated increases in the number of guilty verdicts given in court (Curley et al., 2022). These sources of potential bias pose risks when juries are exercising their role, as implicit beliefs or attitudes toward a defendant have the potential to disrupt a fair trial. A juror's purpose is to determine the facts of the trial by exercising unbiased judgment of the defendant, acting as a collective group of the defendant's "peers" (American Bar Association, 2019). The problem grows when a minority defendant later faces trial and is judged by a jury who may not reflect the "cross-section" of their respective community, which is a common situation especially for Black Americans in the United States (American Bar Association, 2015). There are shifts in a jury's decisions when the defendant identifies within a marginalized community, leading to longer sentences and harsher convictions, which demonstrates a significant underlying problem with jury bias, especially towards minority communities (Anwar et al., 2012; Espinoza & Willis-Esqueda, 2008; Shaked-Schroer, et al., 2008). Therefore, the purpose of this study was to examine how intersectional identities of a defendant (race/ethnicity and religion) could impact juror decision-making, in ways such as verdict decision and confidence, choice of sentencing, as well as perceptions of & emotions toward the defendant, in a murder case with different types of DNA evidence.

Racial and Ethnic Bias in the United States' Courtroom

Within the criminal justice system, racial and ethnic biases may be observed when considering the current United States prison population, as the proportion of incarcerated Black Americans currently stands at triple their proportion of the total population in the country (Pew Research Center, 2020). The same ongoing study found that the proportion of White Americans in the prison population, in contrast, is less than half of their proportion in the current U.S. population (Pew Research Center, 2020). Juries lacking in diversity tend to choose harsher consequences for Black defendants (Shaked-Schroer et al., 2008). In addition, all-White juries tend to give more death sentences to Black versus

White defendants (Shaked-Schroer et al., 2008). However, once the jury was racially diversified with simpler jury instructions presented, this pattern was not seen (Shaked-Schroer et al., 2008).

Espinoza and Willis-Esqueda (2008) found that Mexican American defendants have similarly experienced bias when judged by White American jurors. Longer sentences and higher culpability ratings resulted when Mexican defendants were of low socio-economic status and their defense attorney too was Mexican American (Espinoza & Willis-Esqueda, 2008). Thomson (1997) found evidence of death sentencing discrimination when considering Latinx American defendants in Arizona. In the scenario where a Latinx American killed a White American, the Hispanic American was more than three times as likely to be given a death sentence, as compared to a Hispanic American killing another Latinx American (Thomson, 1997). Similar patterns were observed with White victims and minority defendants, including Black Americans. There is reason to believe that minority defendants are more likely to receive harsher sentences, especially with a White victim involved (Thomson, 1997).

In Canada, a study examined potential differences in juror decision-making when Asian Americans were involved in a domestic violence case, whether in interracial couples (White/Asian) or same-race couples (White/White or Asian/Asian) (Maeder et. al., 2012). The results of this study from Canada were like findings in the United States, such that jurors interpreted the male defendants to be more guilty of abusing their spouse when in an interracial couple, whether that be an Asian or White male. These judgments yielded a much higher certainty of guilt than the White/White or Asian/Asian couple pairings (Maeder et al., 2012). With this perception in mind, it is possible that a juror in the United States can hold similar pre-trial biases that revolve around potential tensions between the Asian American and White American communities. Thus, it is imperative to further investigate racial/ethnic biases facing this community, especially in the context of the courtroom.

Despite the wealth of evidence showing racial and ethnic biases in juror decision-making, very little of that research has addressed biases toward either Arab American or Muslim defendants in the courtroom. Since the attacks on September 11, 2001 in the United States, there has been a rise in xenophobia and Islamophobia, which has targeted Arab and Muslim people (Awan, 2010). According to Awan (2010), the rise in Islamophobia and/or xenophobia can be attributed to an increase in media coverage of the 9/11 terrorist attacks, which project mostly negative images of the Muslim community and faith. It has also been seen that although increasing time has passed since the incident, the "politico-philosophical and literary discourses surrounding the event continue to multiply," which can lead to discriminatory generalizations about the character of the Muslim community, specifically in the Middle East (Awan, 2010). The Arab community may be victims of the rise in xenophobia, since there is evidence that people tend to associate Muslims with being racially or ethnically Arab (Weitz, 2015).

Hiltan et al. (2007) found that Arab immigrants were perceived to be of greatest threat following 9/11, when compared to immigrants of different backgrounds, even after 1 year had passed since the attacks. Based on this pervasive bias, it is necessary to understand how this community might be unfairly judged by a jury of their peers, particularly since there is very little literature exploring this ethnic group.

Little exposure to the Muslim population in the United States, paired with the tragedies of 9/11, and negative media portrayals of the Islamic faith are likely factors to contribute to the negative attitudes and bias towards this group. Maeder et al. (2012) reported that when a Muslim woman was testifying as a victim in an assault case both with and without a hijab in court, higher levels of guilt were attributed to the defendant when the woman wore the hijab during her testimony. It is possible that changes in gender and role within the crime (ie. being the criminal, not the victim) can impact the way that the Muslim defendant is interpreted by the jury, especially as Islamophobia is still a prevalent issue in the United States (Awan, 2010). Media portrayals have encouraged further discrimination and fear of this population and these media contributions are still increasing, decades later (Awan, 2010). Considering the relatively small Muslim population in the U.S., and the abundance of negative media regarding 9/11, there is reason to believe that negative bias may be playing a role in evaluations of Muslim defendants (Awan, 2010; Pew Research Center, 2022).

More than 70% of the United States population in 2022 identifies as Christian (Pew Research Center, 2022). When juxtaposing one's attitudes towards Muslims and Christians in the United States, it was found that the people's self-reported attitudes towards Christians were more positive than Muslims, such that there was moderate implicit preference for Christians and factors including anti-Arab racism and religious fundamentalism were indicative of more negative attitudes towards Muslims (Rowatt et al., 2005). As the religious majority in the United States, it is possible that Christians experience a positive bias, especially in comparison to Muslims. Since the understanding of how religion can impact a juror's decisions is scant in the literature, it is important to understand how being Christian or Muslim could potentially impact perceptions and verdicts. It is essential to explore how Islamophobia is contributing to the justice process when faced with a jury. Intersectional identities at risk for double marginalization in society should also be understood in the courtroom setting, including those from minoritized racial or ethnic groups and varying religious identifications.

There is a gap in the literature when observing these fears in the courtroom setting, particularly when a Muslim person is accused of a crime and being judged by their peers, and when they could be doubly marginalized because of their racial or ethnic background.

Interpretation of DNA Evidence by Juries

Schweitzer and Nuñez (2018) found that DNA evidence can hold a heavy impact in the courtroom for jurors deciding on verdicts, so it is important to understand the mechanisms behind how DNA presentation may relate to certain verdict choices. Furthermore, how DNA evidence is understood in the context of the judgment of a defendant from certain racial/ethnic or religious backgrounds has not been investigated.

There is evidence to suggest that jurors weigh DNA evidence heavily in their verdict decisions, even more than eyewitness testimony or crime scene pictures, among other forms (Schweitzer & Nuñez, 2018). Conversely, DNA evidence may be hard for jurors to understand (Koehler, 2001; Pozzulo et al., 2009). Koehler (2001) found that DNA evidence presented in frequencies (example: 1 in 1,000) tends to hold more weight in assigning a guilty verdict than DNA evidence presented as a ratio or percentage (example: 60%) by likelihood (Koehler, 2001). Jurors favor DNA evidence that is presented in frequencies when the wording of the statistical jargon includes case-specific language about the individual suspect, rather than being introduced in generalized, mathematically equivalent presentations that involve probability concepts (Koehler, 2001). Other researchers have found that inconsistent DNA evidence presented in a statistical manner (ie. a frequency) resulted in lower reliability ratings when compared to inconsistent DNA evidence presented in a general manner (i.e. the DNA was not consistent with the DNA of the defendant) (Pozzulo et al., 2009). The presence of consistent DNA evidence leads to more convictions and higher perceived reliability than inconsistent DNA evidence, demonstrating that DNA evidence does hold weight in jury decisions (Pozzulo et al., 2009). DNA evidence presented in a statistical manner may be confusing to jurors, which can impact a verdict or a defendant's experience in the courtroom as well.

Jurors can also incorrectly interpret probabilities presented separately and also afford less weight to probabilistic evidence as a whole, due to beliefs in potential lab errors or intentional evidence tampering (Schklar & Diamond, 1999). Even DNA laboratory experts may not understand DNA evidence in the context of statistical probabilities, and this has been documented in court cases, such as *State of Texas v. Griffith* (Koehler, 2009). Koehler (2009) further argues that if an expert in the DNA field cannot interpret their own evidence correctly with statistical jargon in the courtroom, it is unlikely that jurors can too. Probabilities presented in frequencies yielded the least understanding overall, demonstrating inconsistencies in a juror's preference of DNA evidence formatting (Koehler, 2009).

It appears that DNA evidence presented with little mathematical jargon leads to the clearest understanding by juries of the evidence at hand (Pozzulo et al., 2009; Ritchie, 2015). However, there are conflicting results with jurors regarding their understanding of frequency statistics in relation to DNA evidence, demonstrating that one's analysis of DNA evidence presented in mathematical formats is inconsistent in nature. The literature

is lacking in regard to DNA evidence being presented to a jury in conjunction with demographic variables, such as race/ethnicity and religion. There is also a gap in the literature regarding how verdicts may change when DNA is not present, leaving jurors to consider solely other forms of evidence when facing defendants of differing demographics. DNA evidence is already confusing for jurors, but the resulting verdicts may change in the context of a defendant from varying racial/ethnic or religious identifications. Within this study, the goal is to understand if any biases emerge as a result of the presence or absence of DNA evidence within certain defendant demographic groups. For example, with DNA evidence present, will the verdict chosen for a defendant who is Arab and Muslim with matching DNA to the crime scene differ from the verdict chosen for a White Christian defendant with matching DNA as well? If yes, then there is evidence to suggest another avenue where bias could arise in the courtroom. Further, will there be discrepancies in verdict decisions between defendant demographic groups when the DNA evidence is not certain at the scene? If yes, then again we find evidence of another route for bias to enter the decision-making process. Although DNA evidence may be confusing to jurors based on jargon, the decisions of guilt for the defendant involved should not change when DNA evidence presented is identical among defendants from all demographics.

The current study will only incorporate DNA evidence in a general, simplistic language, void of any statistical jargon, so that participants are more likely to understand it and to avoid confounds.

The Current Study

The purpose of the current study was to observe how a defendant's race/ethnicity (White / Black / Arab / Latino / Asian), religious identification (Christian / Muslim), and the type of DNA evidence presented in court (consistent / inconsistent / inconclusive) impact evaluations of verdict, sentencing, perceptions, and emotions of jurors towards the defendant. It was expected that with cases including inconsistent or inconclusive DNA evidence (example: not necessarily matching the defendant), the jurors would: (1) judge the Black, Latino, Asian and Arab defendants who identify as Muslim to be the most guilty of the crime and that the defendants would be perceived in the most negative manner, (2) grant the White Muslim counterparts with more leniency in the context of the crime and with the most positive overall perceptions. It was hypothesized that with consistent DNA evidence (i.e. matching the defendant), the jurors would: (1) give more consistent judgments in regards to guilt with DNA evidence present, (2) grant White Christians the most leniency in the context of the crime committed.

METHOD

Participants

The sample consisted of 874 people recruited from Amazon's Mechanical Turk and each participant was given 50 cents for contributing to the study. The study was available to Amazon Mechanical Turk workers who were living in the United States and were at least 18 years old. After removing participants that did not complete most of the survey questions, the final sample included 538 participants. The average age of the participants was 40 years old, with ages ranging from 19 to 79 years old. The participants identified as 52.6% male, 47% female, and .4% preferred not to disclose their gender. The racial/ethnic composition of the sample, which was self-identified by the participants, was 69.9% White, 17.5% Black, 5.6% Asian, 2.4% Hispanic or Latinx, 1.5% multiracial, 1.3% American Indian/Alaskan Native, .6% Middle Eastern/North African, .2% Native Hawaiian, and .11% preferred not to disclose this information. The religious composition of the sample, as self-identified by participants, consisted of 75.1% Christian (nonspecific, including multiple denominations), 8.2% Agnostic, 7.4% Atheist, 3.3% another religion not listed, 1.7% Buddhist, 1.5% Jewish, 1.3% Hindu, .9% Muslim, and .4% preferred not to disclose their religious affiliation.

Materials

Vignettes Detailing the Murder Case

The vignettes used to describe the crime committed were adapted from Pozzulo et al. (2009). Each vignette contained details about a murder at a local bar, involving an altercation and a fatal stabbing, which was seen by a nearby eyewitness. A statement regarding the inclusion of eyewitness testimony was included, but it was emphasized that the eyewitness was unable to make any identifications of the perpetrator to authorities. An expert witness dialogue with a prosecutor in the trial was included as well, which detailed the availability of DNA evidence from the crime scene (via blood at the scene and saliva samples from cigarettes), and its relatedness to the male defendant in question (being either consistent with the defendant, not consistent with the defendant, or the results were inconclusive). Finally, a description of the defendant was included, stating explicitly the name, gender, religion, and racial/ethnic group of the defendant. All components of the vignettes remained the same, except for the racial/ethnic group (as well as the name of the defendant, which was consistent with being either White, Black, Latino, Arab, or Asian), religion (Christian or Muslim), and the expert witness dialogue with the prosecutor, as it pertained to the DNA evidence in that case (consistent, inconsistent, or inconclusive). The demographics were stated at the beginning of each vignette for clarity, and the defendant's racial/ethnic group was re-emphasized during the description of the crime by the eyewitness. The following dependent variables were evaluated after the mock jurors read the vignette of the murder case.

Verdict and Sentencing

Participants were asked whether they believed the given defendant was guilty or not guilty. A positive score was given for a "guilty" verdict (+1) whereas a negative score was given for a "not guilty" verdict (-1). They were then asked to indicate how confident they were in their verdict, on a scale ranging from 1 (extremely confident that the defendant is not guilty) to 9 (extremely confident that the defendant is guilty). The verdict score was then multiplied by the juror's confidence in the correctness of the verdict choice. The resultant variable ranged from -9 (extremely confident that the defendant was not guilty) to +9 (extremely confident that the defendant was guilty). The verdict scale, confidence in the verdict scale, and the combined variable scale (verdict choice multiplied by level of confidence) were derived from Cooper and Neuhaus (2000).

Participants were also asked how long the defendant's sentence should be, if the participant decided that the defendant was guilty of the crime. This scale measured from 0 years to 100 years (Bernhard & Miller, 2018).

Reliability/Influence of the DNA and Eyewitness Evidence

Based on Pozzulo et al. (2009), participants were asked to rate how reliable they felt that the DNA and eyewitness evidence were, and how each influenced their verdict. Participants were asked how reliable they believed the DNA and eyewitness evidence were on a 6-point scale, ranging from 1 (not at all reliable/credible) to 6 (very reliable). They were then asked how influential the DNA and eyewitness testimony were on a 6-point scale, ranging from 1 (not influential) to 6 (very influential).

Emotional Reactions toward the Defendant

Based on Watson and Clark (1994), participants were asked about their overall emotions towards the defendant after reading about the crime and making their verdict. The scale was adopted from the PANAS-X and included two of the original five dimensions of emotions, including the fear and anger scales to measure negative emotions felt by jurors toward the defendant (Watson & Clark, 1994). Participants were asked to indicate how scared they were of the defendant and how angry they felt towards the defendant in the context of the crime committed. Questions were presented to the participants, such as: In thinking about the defendant, how much fear/anger do you feel? Lists were provided that consisted of 12 negative emotion words, with 6 words comprising the fear subscale (afraid, scared, frightened, nervous, jittery, and shaky) and 6 comprising the anger subscale (angry, hostile, irritable, scornful, disgusted, and loathing). Participants were asked to rate their current level of each emotion on a 5-point Likert scale (1 = very slightly or not at all; 5 = extremely). Scores on each subscale were summed, allowing fear and anger score totals to range from 0 to 30, with higher scores indicating greater levels of the negative emotion.

Perceptions of the Defendant

Participants were asked to rate their overall perception of the defendant after reading the case and making a verdict. This scale ranged from 1 (very negative perception) to 5 (very positive perception). Participants were also asked to determine how likable they felt the defendant was. This scale ranged from 1 (very dislikable) to 5 (very likable). Both questions were adapted from Miller et al. (2014).

Participants were also asked how dangerous they perceived the defendant to be, an item which was created for the purposes of the current study. This scale ranged from 1 (not dangerous) to 5 (very dangerous).

Manipulation Check Questions

Participants were asked to indicate the defendant's race/ethnicity, religion, and the status of the DNA evidence pertaining to their assigned case.

Demographic Questions

Participants were asked to state their age, the gender they identify with, race/ethnicity, and their religious affiliation.

Procedure

Participants were recruited from Amazon's Mechanical Turk. After giving consent to participate, participants were randomly assigned to one vignette adapted from Pozzulo et al. (2009) that detailed a murder case varying by the defendant's demographics (racial/ethnic background and religious affiliation) and type of DNA evidence presented (consistent / inconsistent / and inconclusive). Participants were instructed to act as a juror in this case. Participants then responded to various dependent measures, including items analyzing verdict choice, confidence in the verdict choice, sentencing for the defendant, DNA and eyewitness evidence reliability and influence, emotional reaction towards the defendant, and perceptions of the defendant. Afterwards, participants responded to the manipulation check questions and demographic questions. Lastly, participants were debriefed, thanked for their time and attention, and instructed on how to receive their compensation for participating in the study on Amazon Mechanical Turk.

RESULTS

A 5 (Defendant's race/ethnicity: White / Black / Arab / Latino / Asian) x 2 (Religious identification: Christian / Muslim) x 3 (Type of DNA evidence presented in

court: consistent / inconsistent / inconclusive) between-subjects ANOVA was performed on all dependent variables. The Bonferroni correction was utilized for post-hoc analyses.

Verdict and Sentencing

There was a significant main effect of the type of DNA evidence on the level of confidence in the mock juror's verdict, F(2, 507) = 24.97, p = .00, $\eta_p^2 = .090$. When the DNA evidence was consistent (M = 3.83, SD = 5.39), the mock jurors felt more confident in their verdict choice for the defendant when compared to inconsistent DNA evidence (M = .24, SD = 5.13) and inconclusive DNA evidence (M = .46, SD = 5.65).

There was a significant two-way interaction between the defendant's race/ethnicity and religion on level of confidence in the mock juror's verdict, F(4, 507) = 2.78, p = .026, $\eta_p^2 = .021$. The mock jurors felt more confident in their verdict choice for the Black Muslim (M = 2.62, SD = 5.42) defendant in comparison to the Black Christian (M = .46, SD = 5.36) defendant. Figure 1 displays this interaction.

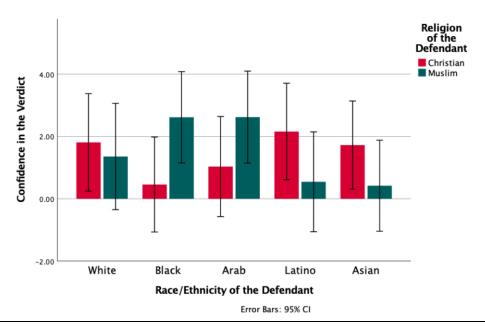


Figure 1. The significant two-way interaction between the defendant's race/ ethnicity and religion on level of confidence in the mock juror's verdict.

There was no significant main effect of the choice of sentencing based on judgments made by mock jurors towards the defendant, regarding their race/ethnicity, religion, or type of DNA evidence.

Reliability/Influence of the DNA and Eyewitness Evidence

There was a significant main effect of the type of DNA evidence on the perceived reliability of the DNA evidence, F(2, 508) = 27.0, p = .00, $\eta_p^2 = .096$. When presented

with consistent DNA evidence (M = 4.74, SD = 1.26), it was perceived to be more reliable than inconclusive DNA evidence (M = 3.76, SD = 1.59). In addition, when presented with DNA inconsistent evidence (M = 4.59, SD = 1.313), it was also perceived to be more reliable than inconclusive DNA (M = 3.76, SD = 1.586).

There was a significant three-way interaction between race/ethnicity, religion, and the type of DNA evidence on the perceived reliability of the DNA evidence, F(8, 508) = 2.58, p = .009, $\eta_p^2 = .039$.

When the DNA evidence was inconclusive, mock jurors perceived the evidence for the Arab Christian (M=4.85, SD=1.04) defendant to be more reliable when compared to the White Christian (M=3.48, SD=1.60) and Black Christian (M=2.57, SD=1.70) defendants. In addition, mock jurors perceived the DNA evidence for the Latino Christian (M=4.06, SD=1.06) and Asian Christian (M=4.50, SD=1.04) defendants as more reliable when compared to the Black Christian (M=2.57, SD=1.70) defendant, even though the DNA evidence was inconclusive.

When the DNA was inconclusive, mock jurors perceived the DNA evidence to be more reliable when the defendant was a Black Muslim (M = 3.87, SD = 1.59) rather than a Black Christian (M = 2.57, SD = 1.70). In addition, inconclusive DNA evidence was perceived as more reliable when the defendant was an Arab Christian (M = 4.85, SD = 1.04) versus an Arab Muslim (M = 3.59, SD = 1.33). Similarly, this pattern was consistent such that the inconclusive DNA evidence for the Asian Christian (M = 4.50, SD = 1.04) defendant was perceived as more reliable than that of the Asian Muslim (M = 3.00, SD = 1.84) defendant. Figure 2 displays this interaction.

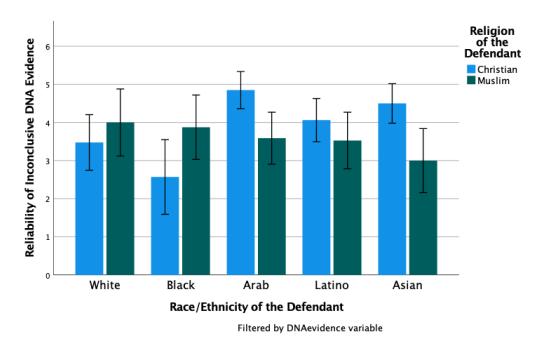


Figure 2. Significant three-way interaction between race/ethnicity and religion on the perceived reliability of specifically inconclusive DNA evidence.

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For the White Christian defendant, mock jurors perceived the DNA evidence to be more reliable when it was inconsistent (M = 5.00, SD = .91) rather than inconclusive (M = 3.48, SD = 1.60). For the Black Christian defendant, mock jurors perceived the DNA evidence to be less reliable when it was inconclusive (M = 2.57, SD = 1.70) when compared to being consistent (M = 4.78, SD = .94) or inconsistent (M = 4.78, SD = 1.17). Figure 3 displays this interaction.

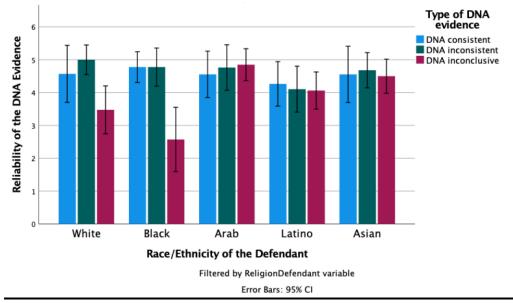


Figure 3. Significant three-way interaction between race/ethnicity of the Christian defendants and type of DNA evidence on the perceived reliability DNA evidence.

Similarly, for the Asian Muslim, when the DNA evidence was inconclusive (M = 3.00, SD = 1.84), it was perceived as less reliable than when it was consistent (M = 4.65, SD = 1.14) or inconsistent (M = 4.38, SD = 1.63). For the Arab Muslim defendant, mock jurors perceived the DNA evidence to be more reliable when it was consistent (M = 5.05, SD = 1.08) rather than inconclusive (M = 3.59, SD = 1.33). Figure 4.

There was no significant main effect of the reliability of the eyewitness testimony in mock juror verdict decisions based on the defendant's race/ethnicity, religion, or type of DNA evidence.

Influence of the DNA and Eyewitness Evidence

There was a significant main effect of the DNA evidence on the influence of the DNA evidence when mock jurors were deciding their verdict, F(2, 505) = 3.49, p = .031, $\eta_p^2 = .014$. When the DNA evidence was inconsistent (M = 4.77, SD = 1.28), the mock jurors regarded it to be more influential in their verdict decisions when compared to the influence of inconclusive DNA evidence (M = 4.39, SD = 1.50).

There was a significant three-way interaction between race/ethnicity, religion, and the type of DNA evidence on the perceived influence of the DNA evidence on mock juror verdict decision-making, F(8, 505) = 2.30, p = .02, $\eta_p^2 = .035$.

When presented with inconclusive DNA evidence, mock jurors perceived the DNA evidence to be more influential in their verdict decisions with a White Muslim (M = 4.79, SD = 1.69) defendant, in comparison to a White Christian defendant (M = 3.67, SD = 1.59).

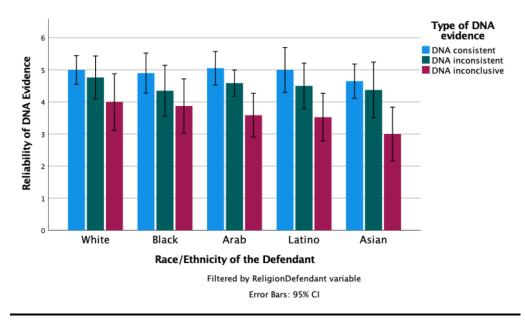


Figure 4. Significant three-way interaction between race/ethnicity of the Muslim defendants and type of DNA evidence on the perceived reliability DNA evidence.

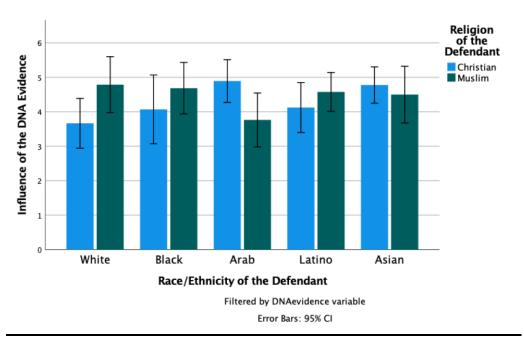
In addition, the inconclusive DNA evidence held more influence for the mock juror's verdict choices with an Arab Christian ($M=4.89,\ SD=1.29$) defendant in comparison to an Arab Muslim ($M=3.76,\ SD=1.52$) defendant. Further, when the DNA evidence was inconclusive and the defendant was Christian, mock jurors were marginally more influenced by this evidence when the defendant was Arab ($M=4.89,\ SD=1.29$) rather than White ($M=3.67,\ SD=1.59$). Figure 5 displays this interaction.

When considering a White Christian defendant, the mock jurors perceived inconsistent DNA evidence (M = 5.00, SD = 1.03) to hold more influence over verdict decisions in comparison to inconclusive DNA evidence (M = 3.67, SD = 1.59). Figure 6 displays this interaction.

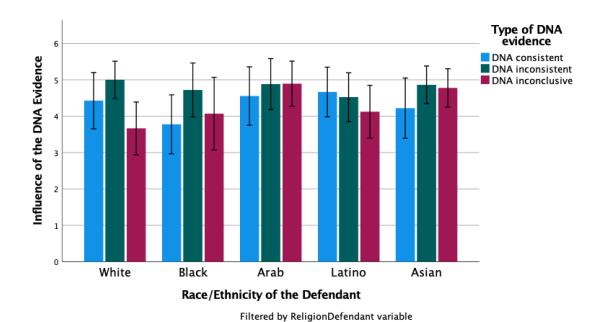
When presented with consistent DNA evidence, it held greater influence for verdict decisions of the mock jurors with the Black Muslim (M = 5.32, SD = .946)

defendant, in comparison to the Black Christian defendant (M = 3.78, SD = 1.63). Figure 7 displays this interaction.

When the DNA evidence presented was inconsistent, mock jurors were marginally more influenced by it when the defendant was Latino Muslim (M = 5.33, SD = .97) rather than Latino Christian (M = 4.53, SD = 1.39). Figure 8 displays this interaction.

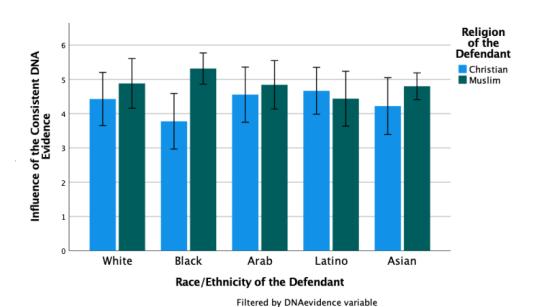


<u>Figure 5</u>. Significant three-way interaction between race/ethnicity and religion of the defendants on the influence of inconclusive DNA evidence.



<u>Figure 6</u>. Significant three-way interaction between race/ethnicity for the Christian defendants and the type of DNA evidence on the influence of DNA evidence.

Error Bars: 95% CI



<u>Figure 7</u>. Significant three-way interaction between race/ethnicity and religion of the defendants on the influence of consistent DNA evidence.

Error Bars: 95% CI

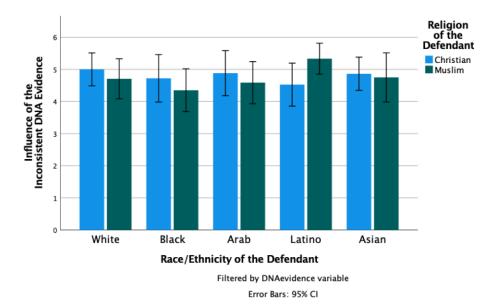


Figure 8. Significant three-way interaction between race/ethnicity and religion of the defendants on the influence of inconsistent DNA evidence.

Note: Difference is marginal but was considered notable for the study.

There was a significant main effect of the type of DNA evidence on the influence of eyewitness testimony in mock juror verdict decisions, F(2, 505) = 5.30, p = .005, $\eta_p^2 = .021$. When the DNA evidence was consistent (M = 3.90, SD = 1.44), the mock jurors weighed the eyewitness testimony to be more influential in their verdict choices when compared to DNA evidence that was inconsistent (M = 3.41, SD = 1.49).

Emotional Reactions toward the Defendant

There was a significant main effect of the type of DNA evidence presented on how fearful the mock jurors felt towards the defendant, F(2, 505) = 3.86, p = .022, $\eta_p^2 = .015$. When the DNA evidence was consistent (M = 18.7, SD = 6.68), the mock jurors felt more fear towards the defendant when compared to being presented with inconsistent DNA evidence (M = 16.6, SD = 7.46).

There was a significant main effect of the type of DNA evidence presented on how angry the defendant made the mock jurors feel, F(2, 504) = 8.42, p = .00, $\eta_p^2 = .032$. When the DNA evidence was consistent (M = 19.3, SD = 6.31), the mock jurors felt more anger towards the defendant in comparison to when the DNA was inconsistent (M = 16.3, SD = 7.62) or inconclusive (M = 16.9, SD = 7.69).

There was a marginally significant two-way interaction between the race/ethnicity and religion of the defendant with anger felt towards the defendant, F(4, 504) = 2.18, p = .07, $\eta_p^2 = .017$. There was marginally more anger felt by the mock jurors towards the

White Muslim (M = 19.8, SD = 7.30) defendant, in comparison to the White Christian (M = 17.09, SD = 7.74) defendant. Figure 9 displays this marginally significant interaction.

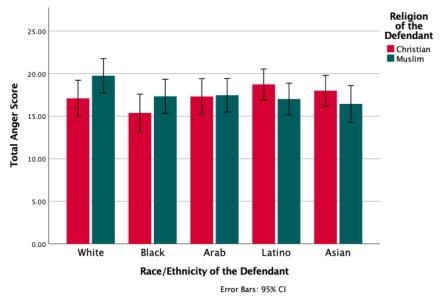


Figure 9. Marginally significant two-way interaction between the race/ethnicity and religion of the defendant with anger felt towards the defendant. *Note:* Difference is marginal but was considered notable for the study.

Perceptions of the Defendant

There was a significant main effect of the type of DNA evidence on the perceived dangerousness of the defendant, F(2, 507) = 17.91, p = .00, $\eta_p^2 = .066$. When the DNA evidence was consistent (M = 3.65, SD = 1.10), the defendant was perceived to be more dangerous than when the DNA evidence was inconsistent (M = 2.92, SD = 1.24) or inconclusive (M = 3.20, SD = 1.10).

There was another significant main effect of the type of DNA evidence on the perceived likability of the defendant, F(2, 505) = 9.55, p = .00, $\eta_p^2 = .036$. When the DNA evidence was inconsistent (M = 3.07, SD = .961), the defendant was perceived to be more likable than when DNA evidence was consistent (M = 2.57, SD = 1.24).

There was a significant main effect of the type of DNA evidence on the overall perception of the defendant as well, F(2, 505) = 14.1, p = .00, $\eta_p^2 = .053$. When the DNA evidence was consistent (M = 2.64, SD = 1.14), the defendant was viewed more negatively in comparison to when the DNA evidence was inconsistent (M = 3.22, SD = .945) or inconclusive (M = 2.91, SD = 1.02).

DISCUSSION

The purpose of the current study was to examine how intersectional identities of a defendant (race/ethnicity and religion) could impact juror decision-making, in ways such as verdict decision and confidence, choice of sentencing, as well as perceptions of and emotions toward the defendant, in a murder case with different types of DNA evidence. The hypotheses were partially supported, as with inconsistent or inconclusive DNA evidence, there was more consistent judgments of guilt or more frequent negative perceptions placed on the defendants that were Black, Latino, Asian, and Arab, over their White counterparts (hypotheses #1 and #2). With consistent DNA evidence, all of the defendants were judged in a similarly harsh basis, with evidence of greater leniency towards the White Christian defendant, in regard to decreased levels of guilt, even with DNA evidence present (hypothesis #3).

Verdict and Sentencing

Mock jurors gained confidence in their verdict choices for all defendants when the DNA evidence was consistent with the given defendant, rather than when the DNA was inconsistent or inconclusive. This finding corresponded with previous literature (Schweitzer & Nuñez, 2018; Pozzulo et al., 2009), further indicating that the jurors placed considerable weight on DNA evidence in their decisions and knew generally how to apply this evidence to the facts of the case. In Schweitzer and Nuñez (2018), DNA evidence was perceived to be one of the most significant factors in the jury's decisions, even more so than pictures from the crime scene or eyewitness accounts. Pozzulo et al. (2009) found that when the DNA evidence matched the defendant in question, the highest rate of convictions and the greatest perceived reliability of the evidence resulted. DNA evidence was presented in a general, non-statistical manner in the study in order to decrease the chances that the mock jurors misunderstood the meaning of the evidence (Koehler, 2001). Thus, it appears that DNA evidence presented, identified as consistent with the defendant in question, was understood clearly by the mock jurors, indicating that there was overall appropriate analysis of the DNA evidence and its meaning relevant to the given case. The current study revealed a continuance of this trend, which has been observed in previous literature (Koehler, 2001; Pozzulo, et al. 2009; Schweitzer & Nuñez, 2018), although there was also evidence to suggest more variability in the mock juror's interpretation of inconsistent or inconclusive DNA evidence in terms of certain race/ethnicity and religion demographics.

In addition, there was some discrepancy with the previous findings when mock jurors were judging a defendant who identified within a doubly marginalized group. When mock jurors were choosing verdicts, there was a significant increase in the confidence of their verdict when the defendant was a Black Muslim, rather than a Black Christian. The Black Muslim defendants, on average, were more often seen to be guilty

of the crime, with greater jury confidence in the decision. This pattern was observed while factoring in all the types of DNA evidence. There was a gap in the literature regarding the judgment of doubly marginalized populations in the courtroom setting, but this pattern does align with the hypothesis that the Black Muslim population would be one of the groups that were judged in a harsher manner. It was also plausible that the US population has had limited exposure to people who identify as Black Muslims and carry bias regarding the Muslim faith based on negative media portrayals since the events of 9/11 (Awan, 2010; Pew Research Center, 2022). A combination of low exposure and the strong impact of the media can explain the negative bias towards the Black Muslim community in the current study, and these findings are supported by prior literature, especially regarding general patterns of discomfort in the United States towards the Muslim community (Awan, 2010; Pew Research Center, 2022).

Reliability in the DNA and Eyewitness Evidence

The type of DNA evidence was related to the interpretation of the reliability and influence of the DNA evidence, as perceived by the mock jurors. Consistent DNA evidence, as well as inconsistent DNA evidence, were perceived to be more reliable to mock jurors when compared to inconclusive DNA evidence. Inconsistent DNA evidence was judged to be more influential to jurors when judging the White Christian defendant when compared to inconclusive DNA evidence. According to Schweitzer and Nuñez (2018), DNA evidence was a highly weighted piece of evidence when it comes to jury decisions. Inconclusive DNA evidence does not present any physical evidence to the mock juror, as both consistent and inconsistent evidence provide some form of DNA evidence for the given case. Therefore, it was reasonable to conclude that the jurors would favor more concrete DNA evidence (Schweitzer & Nuñez, 2018).

With inconclusive DNA evidence, mock jurors felt that the evidence for the Arab Christian defendant was more reliable than the evidence for the White Christian and the Black Christian defendant. Considering that the inconclusive DNA evidence is less informative in comparison to the other forms of DNA evidence, it seemed that the mock jurors weighed the absence of concrete evidence differently when it came to race/ethnicity. The inconclusive DNA evidence was also judged to be more reliable for the Arab Christian compared to the Arab Muslim defendant. This finding highlights the greater power that the DNA evidence held with specifically the Arab Christian demographic. This pointed to racial/ethnic and religious bias, as the jurors judged the uninformative DNA evidence to be more reliable for this group over other demographics, which can impact further perceptions and judgments of that defendant.

In addition, the mock jurors perceived the inconclusive evidence for the Latino Christian and the Asian Christian defendants to be more reliable when compared to the Black Christian defendant. In this case, the Latino and the Asian defendants were judged to be more guilty, even without DNA evidence present. Inconclusive DNA evidence

pertaining to the Black Muslim was also seen as more reliable in comparison to the Black Christian defendant, demonstrating harsher judgment towards a doubly marginalized population, as hypothesized in the current study. Similarly, the inconclusive DNA evidence for the Asian Christian defendant was perceived to be more reliable than that of the Asian Muslim defendant.

A pattern was observed regarding the Christian demographic and the increased reliability of the inconclusive DNA evidence, across a variety of racial or ethnic groups (Latino, Asian, and Arab). This signified bias towards Christians of different races/ethnicities, based on the increased trust in the inconclusive DNA evidence by the jurors, reflected by measures of both reliability and influence. The Arab Christians were consistently judged harsher in the context of DNA evidence, possibly due to the negative stereotypes surrounding Arabs and the Islamic faith (Awan 2010; Hiltan et al., 2007; Weitz, 2015).

When DNA evidence was not present, it should not influence one's decisions of guilt towards a defendant as strongly as when it is present. Therefore, inconclusive DNA evidence should not give adequate information to be trusted for a jury, pointing to racial/ethnic and/or religious biases dictating the differences in interpretations of the DNA evidence by the jurors. On the other hand, the DNA evidence on mock jurors' verdict decisions was significantly more influential when the defendant identified as a Muslim, indicating religious bias present towards the Muslim population. It was possible that the mock juror's biases towards the Muslim community carried over into their interpretation of the DNA evidence, leading to differences in trust and/or use of the evidence. Specifically towards Muslims, there were heightened feelings of fear and anger since the events of 9/11 that may have contributed to differences in the weight of the DNA evidence when making verdict choices (Awan, 2010).

For certain demographics, mock jurors perceived the DNA evidence to be more reliable when it was consistent or inconsistent, rather than inconclusive. This finding was supported by prior literature that emphasized the significance of tangible DNA evidence when jurors must make decisions in the courtroom (Schweitzer & Nuñez, 2018). For the White Christian, Black Christian, Asian Muslim, and Arab Muslim defendants, this finding was especially apparent. In general, we should expect DNA evidence that is somewhat conclusive (match or not) to be reliably utilized by jurors when making decisions in a case (Schweitzer & Nuñez, 2018). This finding demonstrated that mock jurors' perceptions of the usefulness of the evidence does vary depending on the levels of consistency in the DNA evidence, for White Christian, Black Christian, Asian Muslim, and Arab Muslim defendants.

It was plausible that for the other demographics (White Muslim, Black Muslim, Asian Christian, Arab Christian, Latino Christian, and Latino Muslim), all types of the DNA evidence were perceived to have the same reliability, even if none was given (i.e. the inconclusive DNA evidence type). This was problematic and signified biases against

these populations in the courtroom based on their demographic, as the variations in DNA evidence presented should evoke varying judgments for the defendant - rather than the evidence being judged to be reliable at all times. For these demographics, it could be that biases towards the race/ethnicity or religion of the defendant were weighed more readily than the DNA evidence presented. It was unexpected that someone would consider an absence of DNA evidence to be just as reliable in one's verdict decisions as the presence of DNA evidence for any defendant.

Influence of the DNA and Eyewitness Evidence

Overall, the mock jurors judged the DNA evidence to be more influential in their decisions when it was inconsistent, rather than inconclusive. Prior literature suggested that any presence of DNA evidence that was presented in an understandable fashion is weighed heavily by juries, which supported this finding (Schweitzer & Nuñez, 2018).

The influence of the eyewitness testimony in the mock juror verdict decisions was related to the type of DNA presented in the case. Mock jurors perceived the eyewitness testimony to be more influential in their verdict decisions when the DNA evidence was consistent, rather than inconsistent. Considering DNA evidence was a highly influential factor in juror decision-making, it was plausible that the presence of matching DNA evidence to the defendant prompted greater trust in other forms of evidence given in the case, even if the eyewitness accounts generally do not hold as much influence (Schweitzer & Nuñez, 2018).

With consistent DNA evidence, the DNA evidence was judged more influential when judging the Black Muslim defendant's case, when compared to the Black Christian defendant's case. Considering that consistent DNA evidence matched the DNA of the given defendant, this finding signified that the matching DNA was weighed heavier when that defendant was a Black Muslim. Considering the only change between the defendants was their religion, this difference in interpretation indicated religious bias towards the Muslim defendant. It was plausible that this result could be due to low exposure to the Black Muslim population, Muslims as a collective, or simply in more positive biases felt towards the Christian religion rather than the Muslim religion (Pew Research Center, 2022; Rowatt et al., 2005). According to Pew Research Center (2022), almost 3 out of 4 people in the United States are Christians, as compared to less than 1% of the United States population being Muslims. This same rationale can be used regarding the harsher judgments of the Latino Muslim rather than the Latino Christian defendant, with inconsistent DNA evidence. Inconsistent DNA evidence should indicate that the given defendant is not the perpetrator in the case; however, for the Latino Muslim defendant, this DNA evidence held marginally greater influence in the mock juror verdict choice. It was plausible that the Latino Muslim population is relatively rare in most regions of the United States, so biases toward that population could be prevalent. Additionally, fear of the Muslim faith may prompt different interpretations of how to use the DNA evidence (Awan, 2010; Pew Research Center, 2022).

With inconclusive DNA evidence, the mock jurors perceived the DNA evidence to be more influential in their verdict decisions with a White Muslim defendant, in comparison to a White Christian defendant; inconclusive DNA evidence was also perceived to hold marginally more influence when judging the Arab Christian defendant, as compared to the Arab Muslim defendant. Additionally, the mock jurors weighed the evidence marginally heavier when judging the Arab Christian defendant, in comparison to the White Christian defendant. The lack of DNA evidence seemed to hold considerable weight for the Arab Christian demographic, in both reliability and influence. It is plausible that the mock jurors associated the Arab race/ethnicity most strongly with the Muslim religion instead of the Christian religion. Prior literature found that there are negative feelings felt towards the Arab population, such as feeling threatened by them or by making associations to the Muslim faith, even long after the 9/11 events had occurred (Hiltan et al., 2007; Rowatt et al., 2005; Weitz, 2015).

Emotional Reactions toward the Defendant

Emotions felt by the mock jurors towards the defendant were significantly more negative when they were presented with consistent DNA evidence (ie. matching the defendant in question), rather than with inconsistent or inconclusive DNA evidence, across all demographics. It was probable that negative emotions, such as fear and anger, arose when the mock jurors anticipated that the defendant was the perpetrator based on matching DNA evidence. This pattern emphasized that the mock jurors were likely able to competently analyze and weigh the DNA evidence presented to them as it was presented in a non-statistical manner (Pozzulo et al., 2009; Ritchie, 2015, Schweitzer & Nuñez, 2018). Given that the consistent DNA evidence can represent strong evidence that the defendant could be the perpetrator, it was believable that negative emotions accompanied this judgment by the mock jurors.

In addition, mock jurors felt more anger towards the White Muslim defendant when compared to the White Christian defendant for committing the crime, pointing to religious bias towards the Muslim community. As previously stated, the Muslim population has faced Islamophobic attitudes in the United States due to the events of 9/11, which can lead to differences of emotions towards defendants that are representing the faith (Awan, 2010; Pew Research Center, 2022). Lack of exposure to a group can lead to reliance on public sources, such as the media, for information or beliefs about the community. According to Awan (2010), the number of these negative media portrayals were on the rise, as well as fear of the Muslim community as a result of this. Rowatt et al. (2005) also found that people's self-reported attitudes towards Christians were more positive than for Muslims, when judging certain aspects of their sentiments towards the

Muslim community, including feelings towards the Arab population as well as one's own religious preferences.

There was a gap in the literature when observing this overall Islamophobic sentiment in a courtroom setting, particularly when a Muslim person is accused of a crime and is at risk of being doubly marginalized. However, the current findings aligned with what was hypothesized regarding attitudes towards the Muslim community in the courtroom - that the White Christian defendants would experience the most leniency in judgment as compared to most of the Muslim defendants. This was contrary to what was hypothesized, as the White Muslim defendant was not expected to receive significantly harsher judgments in comparison to the Christian defendants.

Perceptions of the Defendant

Mock juror perceptions of the defendant were significantly more negative when the DNA evidence was consistent, rather than inconsistent or inconclusive. These negative perceptions were appropriate for the given study, in that it was likely that someone would view a perpetrator in a significantly more negative light than someone who may or may not be a perpetrator. It was plausible that the mock jurors regarded the defendant in question as more likely to be the perpetrator when the DNA evidence was consistent, and this was demonstrated by the difference in how defendants were perceived across an array of measurements, including levels of dangerousness, likability, and overall perception (positive or negative).

For all levels, consistent DNA evidence led to higher negative perceptions of the defendant, across all races/ethnicities and religions. This trend seemed to accentuate the idea that the mock jurors were able to analyze and weigh the DNA evidence appropriately, depending on if and how it matched up with the defendant across all demographics (Schweitzer & Nuñez, 2018). When the DNA evidence was inconclusive, or not present, mock jurors seemed to perceive the defendant negatively, followed by more positive perceptions with inconsistent DNA evidence in comparison (i.e., not matching the defendant). The defendant was perceived in the most negative light when the DNA evidence was consistent with (i.e., matching) the defendant. With the uncertainty accompanying the inconclusive DNA evidence, it was likely that the defendant would be perceived more negatively in comparison to when the DNA evidence is stated to not be a match to the defendant at all (i.e., when inconsistent). Consistent DNA evidence that matched the defendant in question was likely to prompt the greatest negativity from the jurors, as this can signify that the defendant was the perpetrator.

Limitations & Future Research/Implications

One limitation of the current study included the racial/ethnic breakdown of the participants because most participants were White and Christian. According to Hong (2013), the typical jury to expect in the United States was a jury with majority White

individuals, even when judging a defendant of a minority race/ethnicity. Therefore, it seemed that the racial/ethnic background of the study's participants did represent a typical jury in the United States, but future research should further explore interactions between mock jurors' and defendants' race/ethnicity and how these impact mock jurors' decision-making. Future research should explore more interactions between jurors and defendants representing historically disadvantaged racial/ethnic groups, such as Arab, Asian, Indigenous, and Latinx individuals.

In addition, future research should include more open-ended questions that mimic a real jury deliberation scenario. These types of open-ended questions could provide a greater understanding of a juror's rationale and judgment process while making verdict decisions. This perspective would be especially useful in analysis as well as with being even more applicable to the reality of making decisions in a jury.

Finally, future research should continue to investigate different formats for presenting DNA evidence to jurors. The current study chose to include clear-cut, general DNA formatting, to eliminate confounds of confusion over the DNA evidence. However, it is important to understand the influence that DNA evidence holds in the courtroom with the jury, as well as the ways that juror decisions may change if the evidence is presented in a confusing fashion. It has been found that jurors do not interpret the DNA evidence appropriately when it is presented in a mathematical and/or statistical fashion (Koehler, 2001; Pozzulo, et al. 2009). It is imperative that future studies incorporate different methods of presentation of the DNA evidence for conclusive and inconclusive forms, to better understand juror patterns of comprehension. Specifically, different ways of introducing inconsistent DNA evidence regarding the defendant in question (i.e. statistically vs. not statistically) should be explored. Further, to assess for changes in evidence interpretation based on underlying biases, the future studies should investigate how the defendant's demographics impact juror decision-making, alongside different presentations of the DNA evidence.

As a whole, this study aimed to investigate and uncover the bias that may exist within the criminal justice system, which disproportionately impacts communities of color and religious minorities. With the outcomes of this study, education can be prioritized in order to begin remedying the underlying issues of bias in the courtroom. This is not only related to the field of psychology, but also addresses issues in sociology, political science, and criminology and criminal justice. For example, the study's findings can be used in the training of jurors before they even enter the courtroom setting. It is imperative that jurors are able to identify their own pre-existing biases when it comes to exercising their decision-making. Currently, there is evidence to suggest that jurors receive little guidance in deliberations, meaning that they may unknowingly act on their explicit or implicit biases instead (Shaked-Schroer et al., 2008). With proper education, jurors can experience greater awareness of their personal prejudices, leading to more informed decision-making in a legal context. Defense attorneys could also be informed

on how to spot potential biases in jurors during the voir dire process prior to the trial. Not only are jurors responsible for handling their own biases about others, but those who operate fully within the legal system hold responsibility for who they select to be in the courtroom. These advocates for justice, such as attorneys, should also prioritize the proper training of those who are brought into the jury box so that the trial remains fair and that justice is purely sought. The findings of this study are believed to be able to support the pursuit of fuller education for both jurors and attorneys, as well as others existing within the United States court system, in order to prioritize justice for those at their mercy when in trial.

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