Exploring relationships between racial bias, state empathy, and perceived recovery time following a medical hardship

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Abstract

This experiment investigated whether racial biases exist in laypeople's perceptions of recovery time following a common, medically-related hardship and whether these biases can be explained by differential empathy across race. White participants (n=133) read a vignette describing either a White or Black target who experienced a minor car accident. They then rated the amount of time they felt was reasonable for the target to take off from work and normal activities and how much time it would take to recover physically and mentally. Participants also completed measures of state empathy toward the target and their sleep quality. Results showed a significant main effect of target race, such that participants perceived shorter recovery times for the White (relative to Black) target. The predicted mediation through state empathy was not significant, and sleep quality did not moderate recovery time judgements. Current literature related to race and recovery-related perceptions focuses primarily on medical contexts, but little to no work has investigated the perception of medical recovery times in everyday scenarios such as school life, work life, and social life. We addressed this gap in the literature by investigating whether lay perceivers' predictions of recovery time varied across target races. Understanding lay perceivers' racialized beliefs about recovery time may have implications across employment (e.g., supervisors determining appropriate time off following hardships), education (e.g., different expectations for students coming back from personal hardships), or social domains (e.g., perceptions of one's ability to return to normal social life following a hardship). This experiment adds to a better understanding of the mixed findings in the current literature, though further research is needed to clarify whether and why people judge the recovery time of individuals differently based on their race.

Keywords: Race, Empathy, Hardship Recovery, Sleep

1 INTRODUCTION

The allocation of time is fundamental to all individuals, regardless of their diverse identities and experiences. However, the freedom to allocate how time is spent disproportionately impacts individuals based on elements of privilege, including race. In workplaces, schools, and sports, those with authority—such as HR managers, teachers, and coaches—make critical judgments about how much recovery time individuals need after experiencing medical hardship. For example, an HR manager may determine the number of days off an employee can take, a teacher may grant or deny extra time for a student's assignment, and a coach may decide when an athlete is able to return to competition again. The power to make decisions about how others allocate their time can have significant consequences. These decisions can be influenced by racial biases, potentially leading to inequitable outcomes across racial groups.

Time is often recognized as a social determinant of health, as time is crucial for health maintenance (e.g. getting adequate sleep) and healing (e.g., recovery from an injury[1]). Racial disparities related to time within the medical sphere means that people of color, especially Black individuals, often spend more time seeking medical appointments[2], face longer wait times[3], and spend more time traveling to receive medical care compared to White individuals[4]. Length of stay in hospitals (LOS) has also been found to differ across White and Black patients, as White patients are often seen faster by medical staff, shortening their LOS compared to Black patients[5]. Time dedicated to seeking healthcare not only consumes time that could be spent elsewhere but can also worsen health conditions, leading to further consumption of time and resources that would otherwise

be allocated to non-medical pursuits such as education, employment, and social commitments. Similarly, differences in recovery or perceived recovery time may have similar detrimental effects on both individuals and broader social structures.

In addition to facing racial disparities in healthcare related to time (e.g., LOS), Black individuals also face racial biases in pain perceptions. To this point, Trawalter and colleagues' seminal work found that Black individuals were believed to feel less pain than White individuals following the same injuries[6]. These racial biases in pain perception also bias treatment recommendations among medical students[7]. In their work, researchers found that participants who more strongly supported false beliefs about biological differences (i.e., "Black people's skin is thicker than White people's skin") reported lower pain ratings for a Black (vs. White) target and recommended less intensive pain treatment. Similarly, Druckman and colleagues found that National Collegiate Athletic Association (NCAA) Division 1 sport medical staff perceived Black targets as having higher initial pain tolerance than White targets[8]. Thus, it's apparent that even medical professionals, who are educated and trained, consistently perceive Black individuals to experience less pain than White individuals. Taken together, the previous research provides substantial evidence for racial biases in pain among medical professionals, but does not yet speak to whether these same biases exist in laypeople. Given that time is a valuable resource, our research team was interested in whether differences in pain perceptions based on an individual's race extend to perceptions of the time needed to recover from a medically-related hardship (further defined as "hardship recovery time" or HRT). Because medical recovery time can affect many dimensions of an individual's life, we were interested in whether racial biases exist in how laypeople perceive HRT in non-medical contexts such as employment, education, and sports settings.

1.1 Racial Biases in Interpersonal Evaluation

Findings from previous research suggest that perceptions following a hardship differ based on the race of who has experienced the hardship. Many recent studies[7;9;10] have examined hardship and pain perception, analyzing whether racial biases exist in perceptions of pain following a hardship. They all provided evidence that participants perceived Black (vs. White) individuals to feel less pain when they have experienced a greater hardship while endorsing the idea "hardship leads to toughness"[7;9;10]. Similarly, Deska et al. examined whether people perceive Black people to be less sensitive to social pain (i.e., derogation, exclusion, unfairness) than White people[11]. These researchers found perceivers believed Black (relative to White) individuals were less sensitive to social pain and therefore, required fewer supportive resources such as counseling and community to cope with the same socially painful events. Considering how interpersonal pain evaluations differ based on race, perceptions of recovery time following a hardship may also differ across similar lines.

In addition to race, previous research findings support the idea that pain perceptions also differ across socioeconomic status (SES) and poverty. Summers and colleagues found both laypeople and healthcare professionals believed that individuals with low-SES were less sensitive to pain and consequently needed less intensive pain management than individuals with high-SES, and these biases even extended to judgments of children[9]. Similarly, Cheek & Shafir found that both laypeople and professionals held the belief that individuals with lower SES would be less harmed by negative events compared to those with higher SES[12]. The authors attributed this effect to the perception that negative events are more expected by individuals in poverty and therefore deemed less harmful to them. These findings suggest perceptions of pain are linked to beliefs about how adverse events impact individuals, and that these perceptions differ based on variables of demographic differences such as SES. While these findings all pertain to pain evaluation and perception, no research has extended to look at how similar results may be found in interpersonal prediction of recovery time following a hardship.

1.2 Racial Biases in Interpersonal Empathy

Existing literature supports the idea that there are significant differences between levels of empathy felt for ethnic ingroup and outgroup evaluation targets. Put more clearly, members of one's own ethnic group, their ingroup, will have more empathy for those members compared to people who are not part of their own ethnic group, the outgroup members. Neumann et al. administered images depicting negative (injuries, natural disasters, illness, grief, confinement and assault) and positive (smiling related to a party, and an amusement park) contexts to participants and measured ratings of empathy based on ethnic ingroup and outgroup affiliation to the target in the image[13]. Participants rated significantly higher on three dimensions of empathy (affect, perspective taking, and understanding) for ingroup ethnicity targets than for outgroup ethnicity targets for the negative social contexts. Azevedo et al. additionally examined how race and ingroup versus outgroup affiliation affect empathy-related responses through a neuroimaging approach[14]. These researchers presented video clips depicting White and Black skin colored hands, alongside a control group of violet colored hands, being either painfully penetrated by a syringe or being gently touched by a Q-tip. They found

a significant difference in White participants' empathetic processing, as increased activity within the left anterior insula—a brain region associated with empathy—during the observation of White observation targets' pain versus Black pain. Applying these findings, such differences in empathy levels across racial lines may also facilitate different perceptions of recovery time for other racial groups.

Considering these findings, we were interested to see how state empathy, a temporary response of empathy rather than a personality trait, may play a critical role in the relationship between racial differences and perceptions of recovery following a hardship. Drwecki et al. examined the role of empathy in pain treatment disparities[15]. A sample of undergraduate and nursing professionals reported their state empathy and treatment suggestions after viewing real videos of Black and White patients showing genuine facial expressions of pain. The participants showed significant pro-White pain treatment biases; however, participants partaking in "empathy-inducing, perspective-taking interventions" (such as being instructed to intentionally imagine how each patient feels while being examined for treatment recommendations) showed 55% less pain treatment bias compared to the control group. These pro-White pain treatment biases may carry over to other aspects of evaluating individuals across different racial lines. Just as state empathy facilitated these treatment biases, it may also facilitate biases in perceived recovery time when White participants predict recovery time for Black versus White targets following a hardship.

1.3 Sleep and Empathy

With an abundance of existing research supporting relationships between empathy, racial ingroup versus outgroup affiliation, and perceptions following a hardship, we were additionally interested in how empathy might change. As a cognitively intensive task, empathy often varies as a function of cognitive load and available resources. One well-studied factor that plays into cognitive load is sleep. Significant previous research has linked empathy levels with sleep quality. Guadagni et al. examined whether sleep deprivation decreases the ability to experience emotional empathy toward others[16]. These researchers assigned each participant to one of three groups: (1) before and after a night of total sleep deprivation, (2) before and after a usual night of sleep spent at home, and (3) tested twice during the same day. Participants were administered pre- and post-measurements of direct and indirect emotional empathy. Interestingly, these researchers found the post measurements of both direct and indirect emotional empathy of participants in the sleep deprivation group were significantly lower than other conditions, suggesting that sleep deprivation is linked to lower levels of empathy. Guadagni and their colleagues replicated a similar version of this study in 2016, finding evidence of a significant relationship between individuals' quality of sleep and their ability to share the emotions experienced by others[17].

1.4 Current Experiment

Existing literature suggests that relationships may exist between White participants' evaluations of White versus Black targets and their subsequent empathy and pain/social perceptions; however, there is a gap in current literature about whether these perceptions extend to hardship recovery time perceptions that are made by non-medical professionals. Current literature related to race and recovery-related perceptions focuses primarily on medical contexts, but medical recoveries affect nearly every dimension of an individual's life; for instance, allocating accommodations at school/work, family responsibilities, and social commitments. The present study aims to see if racial biases exist among laypeople's perceptions of recovery after an individual experiences a common hardship, and whether this relationship is mediated by empathy for the target and/or mediated by sleep quality. This research has implications for employment, education, law, and social settings.

We were interested to see if the racial biases in pain perception found by Hoffman & Trawalter extend to perceived hardship recovery time (HRT), and whether racial biases in resource allocation needs found by Deska et al. extend to perceived HRT, such that people will perceive longer HRT for White targets and shorter HRT for Black targets[7;11]. We made this association because pain perception, supportive resource needs, and HRT are all judgments that an individual can make about someone who has experienced a hardship and thus may all be influenced by similar biases in evaluation.

Additionally, we were interested to see if state empathy differs based on racial ingroup versus outgroup affiliations. Based on findings from Neumann et al. and Azevedo et al., we predict that participants will have higher state empathy scores for same-race targets than for other-race targets[13;14]. Further, findings from Drwecki et al. suggest that empathy may be a mediator between the race of the target and perceived HRT[15].

Furthermore, findings from Guadagni et al. and Guadagni et al. suggest that sleep quality directly relates to empathy, such that sleep deprivation is linked to lowering empathetic processing capabilities[16;17]. Thus, we wanted to account for sleep quality as a moderator between race condition and state empathy. Based on the existing literature, our research team had four hypotheses:

Hypothesis 1:

We predict there will be a main effect of race on participants' perception of hardship recovery time (HRT), such that White participants will indicate longer HRT for White targets than for Black targets.

Hypothesis 2:

Furthermore, we predict that the relationship between race conditions and perceived HRT will be mediated by state empathy for the vignette target, such that participants assigned to the White race condition (in the target's racial ingroup) will have higher state empathy scores and thus predict longer HRT for the target than participants assigned to the Black race condition (in the target's racial outgroup). We predict that perceived HRT for the target's race is determinant on the participant's state empathy for their assigned target and that the relationship between race and state empathy will be significant.

Hypothesis 3:

We predict that the relationship between vignette target race and HRT will be moderated by sleep quality, such that perceived HRT differences between the White and Black conditions will be smaller for participants with a higher sleep quality and larger for participants with lower sleep quality.

Hypothesis 4:

Finally, we predict that the mediation model will be moderated along a path by participant sleep quality, such that the mediation model will be weaker for participants with a higher sleep quality and stronger for participants with lower sleep quality.

The present experiment sought to understand the interplay of race, empathy, and participant sleep quality as they relate to the evaluation of a target's recovery time. Participants were presented with a vignette depicting either a White or Black target undergoing a significant hardship and then were asked to estimate how long that target's recovery would take using a novel measure designed for this study. Following, participants were asked to evaluate how much they were able to empathize with the vignette target using a standard measure of state empathy for the target. Participants were also asked to report the quality of their sleep using an established scale. Including these variables offered a more comprehensive approach than previous research and allowed us to explore potential mechanisms for racial empathy biases while investigating potential points of intervention to mitigate these biases.

2 METHODS AND MATERIALS

2.1 Participants

We recruited 142 American participants for an experiment via Connect, an online recruitment hosted on Amazon's CloudResearch[18]. All participants were compensated $0.50 through Connect for a survey that took approximately 3-7 minutes. We excluded nine participants for not identifying their race as White/European American in keeping with our exclusion criteria. All participants passed our attention check, recalling what happened to the target in the vignette and indicating that their data would be used for research. Our final sample included 133 participants. Participants' sex assigned at birth was 50.4% male and 49.6% female, and participants' gender identity was 48.9% men, 48.1% women, 1.5% nonbinary, and 1.5% declined to share. The final sample was entirely White based on the exclusion criteria for our experiment. The participants' ages ranged from 19 to 75 (M_{age}= 39.31, SD_{age} = 11.73).

A sensitivity analysis in G*Power[19] indicated that this sample size (N=133) was powered to detect a small to medium effect (Cohen's d = 0.43, $\alpha = 0.05$, $\beta = 0.80$) or greater for an independent-samples t-test with 80% power.

2.2 Materials

Vignette

Participants read one of two vignettes during the experiment. The vignettes included basic information about a target named 'Alex,' including their age, race, and city of residence. The vignettes described an incident and subsequent consequences for Alex. Across both conditions, all information in the story except the stated race of the target (White versus Black) was consistent:

> "Alex, a 32-year-old [White/Black] American living in Denver, was sitting at a red light waiting for the light to turn. Their car was rear ended at a moderate speed by another driver who was not paying attention. Alex sustained a concussion, moderate whiplash, and some minor bruising. Alex felt a variety of emotions during this incident and after."

Novel Perceived Recovery Time Measure

After viewing the vignette, participants answered a series of novel questions that were developed for this study that sought to evaluate participants' perceptions of how long it would take the target to recover from the incident in the vignette. The novel measure of perceived hardship recovery time (HRT) included the following four questions: "How much time do you think is reasonable to take off from work following this accident?", "How long do you think it will take this person to get

back to normal daily activities?", "For how long do you think this event will have a major impact on this person's physical abilities?" and "For how long do you think this event will have a major impact on this person's mental health?". These questions were evaluated using a multiple-choice question ranging from "1 day" to "1 year+" with eight total choices. These were collated into a summed composite variable with higher scores indicating longer expected HRT (M = 16.29, SD = 4.90). This novel demonstrated strong internal validity within our sample (Cronbach's α = .82).

Individual Difference Measures

State Empathy Scale. Following the experimental manipulation and measurement of the anticipated character recovery time, participants completed two individual difference measures. The first of these was the State Empathy Scale (SE), which evaluates the level of state empathy that participants had for the character they read about in the vignette[20]. The SE scale has twelve total items and is broken down into three subscales of four questions each: the affective empathy subscale ("I can feel Alex's potential emotions"), the cognitive empathy subscale ("I can understand what Alex is going through in the story"), and the identification subscale ("I can identify with Alex in the story"). Each individual item is then evaluated on a scale from "Not at all" to "Completely" with five total options. These answers can then be summed into a composite score for the scale in aggregate or for the individual subscales, with higher scores indicating greater state-level empathy for the target (M = 42.0, SD = 9.43). The total composite scale showed very strong internal validity in our sample (α = .91).

Sleep Quality Scale. The second individual difference measure was the Sleep Quality Scale (SQS), which evaluates six domains of sleep quality – daytime symptoms, restoration after sleep, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction – over the past month[21]. The SQS consists of 28 items and is divided into six "factors" or subscales. Every item in subscales two and five are reverse scored. All items are scored on a four-point Likert scale ranging from "few" to "almost always," with guidance being given for how to respond based on how many days participants identified with an item in a given week. Sample items from the scale include "I fall into a deep sleep" and "Poor sleep gives me headaches." These items are then summed for a composite variable with higher scores indicating higher quality sleep (M = 59.17, SD = 16.01). In our sample, the scale showed very strong internal validity (α = .94).

2.3 Procedure

Participants were recruited through the Connect online platform[18] and took the questionnaire via Qualtrics survey software. Participants were first directed to an implied consent form. If they did not consent, they were sent to the end of the survey. Participants who did consent to the experiment were randomly assigned to one of two vignette conditions (White target or Black target). Participants were instructed that in the first part of the survey, they would read a story describing a situation and then would then be asked a series of questions about this situation and the person in it. Participants were instructed to rely on their "gut instinct" when selecting an answer, as there are no "right" or "wrong" answers. Participants were then presented with their assigned vignette condition detailing a minor car accident at a traffic light and made ratings of their perceptions of the target's recovery time, which were measured through a novel scale. Participants then completed the State Empathy Scale and the Sleep Quality Scale to measure individual differences[20;21]. After completing both scales, participants completed an attention check question asking what happened to the target in the vignette. After completing the attention check, participants answered a series of demographic questions, including sex assigned at birth, current gender identity, racial identity, age, and education status. All data collection was completed in May 2024.

3 RESULTS

We conducted a series of exploratory correlational analyses to test the connections between our constructs. As shown in Table 1, the relationship between sleep quality and state empathy was not significant, $r(131)$= .13, p = .141. The relationship between perceived recovery time and sleep quality was not significant, $r(131)$= .13, p = .132. Perceived recovery time and state empathy were significantly correlated with one another, $r(131)$= .18, p = .039. This is a weak positive correlation.

	Mean	SD	HRT	SE Scale	SQS	Race Condition
HRT	16.29	4.90	1			
SE Scale	42.0	9.43	.179*	1		
SQS	59.17	16.01	.131	.128	1	
Race Condition	1.51	0.50	.197*	-.129	.039	1

Table 1 Correlation table of individual difference measures and their association with race condition (1 = White, 2 = Black) (* = p<.05)

We first tested our hypothesis that there would be a main effect of the race of the vignette target on participant-rated HRT such that participants who saw a Black target would perceive shorter recovery times than those who saw a White target. We conducted an independent-samples t-test comparing the average recovery time perceptions for the two race conditions.

This analysis yielded a significant effect of target race on HRT, $t(131) = -2.31$, $p = .011$, 95% CI [-0.74, -0.06], $d = -0.40$. People who were in the White vignette condition ($M = 15.31$, $SD = 4.86$) perceived a shorter recovery time for the target than people who were in the Black vignette condition ($M = 17.24$, $SD = 4.78$). Next, we looked at our second hypothesis of whether participants' state empathy toward the vignette target differed based on the race of the target. We conducted an independent-sample t-test comparing participants in the White target condition and participants in the Black target condition on state empathy scores. Although the analysis was approaching significance, there was not a significant effect of target race on empathy for the target, $t(131) = 1.49$, $p = .139$, 95% CI [-0.80, 5.64], $d = .26$. Participants in the White target condition ($M = 43.23$, $SD = 8.26$) had directionally, but not significantly, higher state empathy scores for the vignette target, Alex, than participants in the Black target condition ($M = 40.81$, $SD = 10.35$).

To examine the relationship between race and recovery time further, we conducted a moderation analysis to see if sleep quality moderated the relationship between race condition and perceived recovery time using the PROCESS Macro in SPSS[22]. In the analysis, perceived recovery time was regressed on to race condition, sleep quality, and their interaction. Race condition and sleep quality were mean-centered before conducting the analysis. Although the overall model trended towards significance, it was not significant, $F(3, 129) = 2.52$, $p = 0.061$. The analysis further indicated the main effect of race condition remained significant, $b = 1.88$, $t(129) = 2.25$, 95% CI [0.23, 3.53], $p = 0.026$, however, there was no significant main effect of sleep quality, $b = 0.68$, $t(129) = 0.81$, 95% CI [-0.10, 0.23], $p = 0.421$, nor a significant interaction between sleep quality and race condition on perceived hardship recovery time, $b = -0.02$, $t(129) = -0.37$, 95% CI [-0.12, 0.08], $p = 0.709$.

To investigate our third hypothesis, we tested whether the relationship between race condition and state empathy toward vignette target was moderated by participant's reported sleep quality, such that state empathy differences between the White and Black race conditions will be smaller for participants with a higher sleep quality and larger for participants with lower sleep quality. We conducted a moderation analysis via PROCESS Macro[22] in which state empathy scores were regressed onto race condition, sleep quality scores, and their interaction. Race condition and sleep quality were mean-centered before calculating the interaction term. The overall model was not significant, $F(3, 129) = 1.80$, $p = .151$. This analysis indicated no main effect of sleep quality, $b = -.06$, $t(129) = -0.35$, 95% CI [-0.38, .26], $p = .729$ and no significant main effect of race condition, $b = -2.52$, $t(129) = -1.55$, 95% CI [-5.73, .69], $p = .123$. There was no interaction between sleep quality scores and race condition, $b = .09$, $t(129) = .88$, 95% CI [-0.11, 0.29], $p = .383$.

Finally, to test our fourth hypothesis, we conducted a statistical mediation analysis with 5,000 bootstrapped resamples (PROCESS Macro[22]) to examine whether state empathy scores mediated the effect of randomly assigned vignette viewing conditions (1 = White; 2 = Black) on HRT. The 95% CI for the indirect effect included zero, $b = -0.26$, 95% CI = [-.85, .08], indicating the mediation model was not significant (see Figure 1 for all pathways).

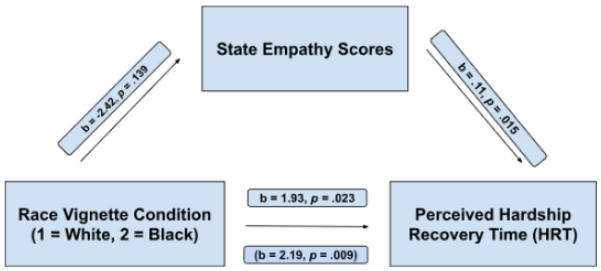

Figure 1. Mediation diagram depicting hypothesis 3 of the study with the individual statistics of each of the pathways of the mediation in addition to the indirect effect pathway.

4 DISCUSSION

4.1 Summary of Results

Our findings suggest that Black individuals are perceived to take longer to recover from a relatively common hardship than White individuals, and that individuals may have more empathy toward people in their racial ingroup than racial outgroup. Our findings contradict our first hypothesis and previous literature. We predicted that participants would perceive longer hardship recovery time (HRT) for White targets than Black targets based on previous research findings that Black individuals have a higher pain tolerance[8], feel less pain[10], and require fewer supportive resources to cope with socially painful events[11] than White individuals. We hypothesized that HRT perceptions would parallel literature regarding perceptions of pain and supportive resource needs, as all are judgments that can be made following a hardship. Instead, we found that participants perceived shorter recovery times for the White targets than the Black targets.

Additionally, our findings suggest that higher state empathy is shown for White targets than Black targets among the White sample, which is supported by previous literature. We predicted that the relationship between race conditions and perceived HRT would be mediated by state empathy for the vignette target, such that participants assigned to the White race condition (in the target's racial ingroup) would have higher state empathy scores and thus perceive longer HRT for the

target. We formed this hypothesis based on previous research findings that people may have higher empathy for those in their racial ingroup [13;14] and favor White (versus Black) targets in state empathy and treatment biases from pain expressions [15]. Our results indicated a slight inclination towards support of this previous literature, but it was not significant. We did not find any relationships between sleep quality and empathy toward the target. This contradicted the third and fourth hypotheses and previous literature suggesting that lower sleep quality is linked to lowering empathetic processing [16;17].

4.2 Contradictions Within Literature

Our findings align with some existing literature. For instance, Johnson and colleagues found that people perceived individuals of low socioeconomic status (low-SES) as requiring more coping resources and support in painful social situations compared to their high-SES counterparts [23]. The researchers suggested that empathetic concern for low-SES individuals heightened perceptions of their social pain and increased expectations that they would need more support to handle difficult circumstances. This differs from our hypothesis that people would show more empathy towards their racial ingroup. Instead, Johnson and their colleagues found that empathetic concern was associated with those perceived as less advantaged in daily life [23]. Given that all our participants identified as White in the present study, they may have perceived Black individuals as less advantaged or underprivileged. This perception could explain why our participants attributed longer recovery times to Black targets, contrary to our initial hypotheses, as participants may have speculated that Black targets lacked resources or faced other societal boundaries which led to longer expected recovery times. In contrast, participants may have perceived White targets as having greater advantages and access to resources, thus needing less time to recover.

The present study addresses a gap in the literature about how laypeople perceive the time needed to recover from a hardship, as current literature about target race and recovery perceptions focuses on medical contexts. Further research is needed in this field to draw further conclusions about the relationships between race, empathy, and HRT.

4.3 Implications

This research makes important contributions to the study of race, empathy, and social perceptions related to hardship recovery time (HRT) and has implications for theoretical and practical contexts.

Our findings in the present study both align and contrast with current literature about pain and hardship perceptions, which has theoretical implications for the current literature. The variance in findings and interpretations between the present study and existing literature suggest there may be other variables that affect the relationship between race, empathy, and recovery time. For instance, judgments about recovery time may vary across regions of the United States, depending on the type of hardship endured and attitudes about time as a resource. One important implication is that further research is needed to investigate these variables and how they may interact with the findings of the present study.

Practically, our findings have implications across domains where judgments about recovery time among laypeople can significantly impact individuals' lives. In workplace settings, employers making decisions about time off or accommodations following an injury or accident may be influenced by biased perceptions of recovery needs based on an employee's race. In educational contexts, differences may exist among teachers or administrators allocating extensions or accommodations to students recovering from hardships. In healthcare, expectations among medical professionals about recovery time may influence treatment trajectories that differ between racial groups. Ultimately, these biased perceptions of recovery time may contribute to broader racial disparities. For instance, if Black individuals are consistently expected to need longer recovery times following a hardship, this could reinforce stereotypes about being less capable of coping with adversity, potentially leading to reduced opportunities across social and professional contexts.

Our research also has implications for implementing recovery time perceptions in diversity training curriculums. In the present study, we found that individuals perceived longer recovery times for Black targets than White targets; training programs may need to specifically address stereotypes around recovery times and accommodations following hardships across racial groups. One way to address this is for workplace and educational settings to standardize recovery-related accommodations, such as sick time or leave for workers. This will help mitigate the impact of individual racial biases among teachers and employers and create more equitable opportunities for students and employees across racial groups. Additionally, having diverse representation in leadership roles within institutions where decisions about recovery time are made is an important implication of this research, as we found that White individuals tend to perceive necessary recovery time differently for individuals of different races.

The present study makes contributions to the literature on racial biases in hardship recovery perceptions, but emphasizes the complexity of racial biases. Our findings both align with and contradict the current literature, emphasizing the need for further research in this

field. Addressing biases in recovery time perception is important for ensuring equitable treatment across racial groups in domains such as healthcare, employment, education, and social life.

4.4 Limitations

It is important to note that our study has limitations. Although the State Empathy Scale is a validated scale that showed very strong internal validity in our sample (α = .91), there were some items that did not fully translate to the vignette scenario[20]. For example, item 8 asks "Alex's reactions to the situation are understandable," but our vignette vaguely states, "Alex felt a variety of emotions during this incident and after." A few items from the State Empathy Scale required participants to infer Alex's scenario beyond what was stated in the vignette, which may have been confusing for some participants[20].

A second limitation is that sleep quality is more accurate when measured physiologically compared to self-report. While the SQS is comprehensive and showed very strong internal validity in our sample (α = .94), using biological measures to index sleep quality yields more accurate results[21].

A third limitation is that the present study used an all White sample. While this allowed us to have equal representation in both conditions, it greatly limits the generalizability of our results to a racially diverse society.

Furthermore, our manipulations were limited to only Black and White vignette targets. Thus, the results from the present experiment are not inclusive of interracial individuals. Additionally, since Black and White vignette target manipulations are common in the social psychology realm, it is possible that participants may have inferred our experimental conditions and guessed at hypotheses surrounding the relationship between race and recovery time.

Lastly, although we were adequately powered to find a statistical effect, we only found a significant effect from the t-test. Having a larger sample would have made us more adequately powered to detect higher order effects, such as the mediation and moderation effects that we initially hypothesized.

4.5 Future Directions

In future studies, we recommend that sleep quality is measured physiologically rather than self-reported. For instance, conducting an explicit sleep manipulation by having a "sleep deprivation" condition to compare to either a control/"well-rested" condition. Though we recognize that lab studies have limitations, measuring sleep physiologically would allow for a better operationalization of sleep quality. Perhaps, through these measures, we would find results that better reflect the literature that suggests sleep quality is positively correlated with state empathy[16], as well as our hypotheses from the present experiment that perceived HRT differences between the White and Black conditions will be smaller for participants with a higher sleep quality and larger for participants with lower sleep quality.

Furthermore, we recognize the perpetuated myths and over-exaggerations in the United States regarding racial minorities' use of social welfare programs and how this may impact perceived recovery time – wherein those who believe racial minorities to struggle is 'expected' and that they would need more recovery time and support than someone they can better relate to. In order to parse the relationship of recovery time and the expectation of using welfare programs, we encourage future research to develop a scale looking at the expected use of welfare programs for both conditions and seeing whether that has a relationship with perceived recovery time. A potential hypothesis for this experiment would be that participants who see a minority vignette target would rate them more likely as taking advantage of social welfare programs due to the prevalent view that minority groups, especially Black people, are primary recipients of welfare[24]. Furthermore, if minority groups are more highly rated as being expected to be welfare recipients, we expect future results to resemble what we found in this study, wherein we believe those who are rated to be higher in likelihood of receiving welfare support would also have longer recovery times. This would be reflective of the literature, where Johnson et al. have found that lower-SES individuals are seen as needing more social support to recover from painful social situations[23]. It would also be within our interest to investigate how participants may be conflating race with a target's SES when thinking about target recovery time, as this relationship could be influencing results outside our predictions.

As the current literature has mixed findings about racial biases in resources needed following a hardship, future research should expand upon why participants perceived longer recovery times for Black targets compared to White targets. Future research should consider racial perceptions in the expected use of welfare or social programs. There are pervasive cultural myths in the United States about racial minorities' use of social welfare programs; exploring if these myths relate to perceptions of recovery time may shed light on other implicit biases. If participants perceive someone in a racial minority group to take more advantage of social welfare programs, we hypothesize that they additionally will predict a longer hardship recovery time compared to a White counterpart.

Additionally, it is possible that participants in the present study rated Black targets to need longer recovery time due to an overcorrection of implicit racial bi-

ases they have. Some Americans have anxiety about being racist, and, therefore consider that the research study may be testing for racial bias, ultimately overcorrecting or overthinking their initial reaction to the survey.

A final direction to explore is how individuals perceive recovery time for targets beyond Black and White identities. Based on findings from the present experiment, we predict similar results for other racial minorities, such that non-White targets would be perceived to have longer recovery times than White targets. Although the effects of state empathy on recovery time were not significant, it was pointing in the direction of significance, so it would be of value to revisit this relationship and further explore the potential behind it.

5 CONCLUSION

The results of the current experiment suggest that while humans do evaluate one another differently on the basis of race following a hardship, there is still work to be done in figuring out why these differences exist and through what different mechanisms they may occur. The findings still have significant implications for fields like management and medicine where individuals may be evaluated in similar contexts to the one in this experiment, and real-life decisions must be made about the logistics of their recovery. Understanding that there are biases in our evaluation of recovery time for others is critical to ensuring equitable practices in these fields. Future research could expound on the mechanisms and reasons why these relationships exist and how the evaluation of hardship recovery across racial groups may differ from other phenomena in the literature, such as pain perception or medical treatment. To conclude, this work furthers understanding of how racial identities impact our evaluation of others. While there is still further research needed to understand these biases and how we might mitigate them in practical application, the present study makes interesting theoretical and practical contributions to the literature, filling a gap in the literature about racial biases in lay persons perceptions of hardship recovery time.

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7 AUTHOR NOTE

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8 EDITOR'S NOTES

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Appendix A

Research Materials

Hardship Recovery Time Index

1. How much time do you think is reasonable to take off from work following this accident?
2. How long do you think it will take this person to get back to normal daily activities?
3. For how long do you think this event will have a major impact on this person's physical abilities?
4. For how long do you think this event will have a major impact on this person's mental health?

All items were responded to on a scale including 1(1 Day), 2(3 Days), 3(1 week), 4(2 weeks), 5(1 month), 6(3 months), 7(6 months), 8(1 year).

State Empathy Scale

1. Alex's emotional response is genuine
2. I experienced the same emotions as Alex may have when reading this story
3. I was in a similar emotional state as Alex when reading this story
4. I can feel Alex's potential emotions
5. I can see Alex's point of view
6. I recognize Alex's situation
7. I can understand what Alex was going through in the story
8. Alex's reactions to the situation are understandable
9. When reading the story, I was fully absorbed
10. I can relate to what Alex was going through in the story
11. I can identify with the situation described in the story
12. I can identify with Alex in the story

All items were answered on a Likert scale including 1 "Not at all", 2 "A little", 3 "A moderate amount", 4 "A lot", and 5 "Completely".

Sleep Quality Scale

1. I have difficulty falling asleep
2. I fall into a deep sleep
3. I wake up while sleeping
4. I have difficulty getting back to sleep once I wake up in the middle of the night
5. I wake up easily because of noise
6. I toss and turn
7. I never go back to sleep after awakening
8. I feel refreshed after sleep
9. Poor sleep gives me headaches
10. Poor sleep makes me irritated
11. I would like to sleep more after waking up
12. My sleep hours are enough
13. Poor sleep makes me lose my appetite
14. Poor sleep makes it hard for me to think
15. I feel vigorous after sleep
16. Poor sleep makes me lose interest in work or others
17. My fatigue is relieved after sleep
18. Poor sleep causes me to make mistakes at work
19. I am satisfied with my sleep

20. Poor sleep makes me forget things more easily
21. Poor sleep makes it hard to concentrate at work
22. Sleepiness interferes with my daily life
23. Poor sleep makes me lose desire in all things
24. I have difficulty getting out of bed
25. Poor sleep makes me easily tired at work
26. I have a clear head after sleep
27. Poor sleep makes my life painful

Participants were instructed to answer the questions using the following guide: "Rarely: None or 1-3 times per month", "Sometimes: 1-2 times per week", "Often: 3-5 times per week", "Almost Always: 6-7 times per week"

Manipulation Vignette

"Alex, a 32-year-old [White/Black] American living in Denver, was sitting at a red light waiting for the light to turn. Their car was rear ended at a moderate speed by another driver who was not paying attention. Alex sustained a concussion, moderate whiplash, and some minor bruising. Alex felt a variety of emotions during this incident and after."