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Distributive justice criteria and social categorization processes predict healthcare allocation bias

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Abstract

Objectives: Drawing on theories of distributive justice and intergroup discrimination, we examined how much distributive justice criterion and racial group membership contribute to bias in healthcare allocation decisions, by testing a theoretical model that specifies perceived stereotypicality and individual responsibility as a serial mediation process in the relationship between disease's contraction controllability (controllable vs. non-controllable) and bias in medical decision-making.

Method: White Portuguese medical students ($N = 213$) participated in an online experimental study conducted in two phases. In phase 1, we manipulated the cause of disease contagion and the salience of patient's racial categorization, and measured the stereotypicality of behaviour. In phase 2, we assessed perceived responsibility and likelihood of recommending medical treatment.

Results: Controllable (vs. non-controllable) contraction behaviours in phase 1 were perceived as more stereotypic. As a spillover effect, more stereotypical behaviours in phase 1 predicted more patient's responsibility for their disease in phase 2. Importantly, controllable behaviours of disease contraction in phase 1 negatively affected recommendations for medical treatment in phase 2; and this negative effect was serially mediated by the stereotypicality of behaviour and patient responsibility. Furthermore, patients' skin colour moderated this process, meaning that perceptions of controllable behaviour as more stereotypic were stronger for Black than for White patients.

Conclusions: This research shows how stereotyping and social categorization bias allocation decisions through the patient's level of responsibility in decision-making processes. The findings are discussed in light of principles of distributive justice and the literature on intergroup relations with respect to racial disparities in health care.

KEYWORDS

distributive justice principles, healthcare allocation decisions, intergroup discrimination, perceived responsibility, stereotypes

Statement of Contribution***What is already known on this subject?***

- Models of distributive justice suggest that perceived individual responsibility predicts the unequal distribution of scarce medical care.
- Research on social categorization processes in the distribution of health care resources has shown that racialized groups are most affected by the unequal distribution of medical care.

What does this study add?

- An analytic model based on two complementary perspectives (i.e. justice-based criteria and social categorization processes) that uniquely and jointly predict bias in patient prioritization decisions when health care resources are scarce.
- A serial moderated-mediation model showing that the negative influence of controllability of behaviour on prioritization of medical treatment is serially mediated by behaviour stereotypicality and patient-perceived responsibility. Controllable (as opposed to uncontrollable) behaviours are seen as more stereotypical, and the more stereotypical the behaviour, the more the patient is seen as responsible for his or her situation.
- Racial categorization moderates this process in that the perception of controllable behaviour as more stereotypic was stronger in black patients than in white patients.

INTRODUCTION

The advent of the Coronavirus pandemic highlighted the problem of rationing care, especially when the available medical resources proved insufficient to treat everyone. When faced with the decision of prioritizing patients for treatment, healthcare providers rely mainly on medically relevant parameters. When such treatments are scarce or limited, the nature of the decision may, to a certain extent, pave the way to other non-clinical factors in the process of deciding whom to prioritize (Basson, 1979; Shatin, 1966). Such types of prioritizing decisions are a form of social behaviour with a strong impact on people's lives and may lead to an unequal allocation of healthcare resources (Costa-Lopes et al., 2018). Thus, this research explores to what extent non-clinical factors, such as social information about patients' behaviour and attributes influence healthcare providers' decisions when medical treatment resources are scarce or expensive.

Two broad but separate perspectives focus on the socio-psychological factors that may lead to unequal allocation of healthcare resources. The first social-psychological perspective focused on distributive justice principles (Basson, 1979; Evans, 1983; Fortes & Zoboli, 2002; Nagarajan, 1980; Selvaraj et al., 2017; Skitka & Tetlock, 1992; Ubel et al., 2001). This approach addresses which principles of justice should be applied in decision-making processes when something of value is scarce and not everyone can access it (Deutsch, 1975). Thus, distributive justice revolves around the fairness of the distribution of resources (Deutsch, 1985). In healthcare, such questions arise in conjunction with who gets the scarce or expensive medical resources, and how treatment is allocated (Le Grand, 1987). For example, some individuals may be seen as deserving more resources than others because of their social value or merit (equity principle; Shatin, 1966), or because they are most in need (need principle; Deutsch, 1975). Nevertheless, a critical dimension of distributive criteria is the principle of individual responsibility (Skitka & Tetlock, 1992). Individuals may be seen as deserving fewer resources than others because they are perceived as more

responsible for their predicament, particularly when resources are scarce (Skitka & Tetlock, 1992). Accordingly, perceived responsibility is a factor that influences justice-based decision-making processes, as it is assumed that beneficiaries have control over their behaviours and should be responsible for the consequences of their acts.

The second social-psychological perspective focused on patient group membership as a relevant cue in providers' decision-making (Stone & Moskowitz, 2011). This line of research has consistently shown that racial/ethnic minorities tend to be disproportionately affected, in that they tend to be more discriminated against in healthcare decisions (Burgess et al., 2008; Hagiwara et al., 2020; Major et al., 2013; Murphy-Berman et al., 1998; Penner et al., 2013; Smedley et al., 2003). For example, a study on healthcare allocation decisions showed that Black patients received lower priority scores when it comes to being offered medical treatment, compared to White patients, particularly when unemployed (Murphy-Berman et al., 1998). Thus, being Black or White influenced evaluators' responses, as they tended to offer preferential treatment to White recipients, at least under certain conditions. Therefore, the patient's skin colour may be a critical factor when prioritizing patients because it may trigger more negative inferences about the patient's behaviour, such as their responsibility for past actions.

Considering the competing roles of these two types of processes in medical decision-making, the current study aimed at exploring how justice-based criteria and racial categorization processes uniquely and jointly motivate patient prioritization when healthcare resources are scarce. In the current research, we focused on distributive justice principles to examine whether perceiving a patient as responsible for his/her illness affects medical decisions involving patient prioritization. And most importantly, because racial associations may be a weighing criterion for certain principles of justice during the decision-making process, we examined how behavioural stereotypes affect medical trainees' perceptions of patients' responsibility for their illnesses.

Justice-based allocation of healthcare resources

Models of distributive justice, such as Skitka and Tetlock's (1993) contingency model of allocation, assume that when resources are limited or insufficient, decision-makers consider how much claimants should be held accountable for their situation. If claimants are not equally perceived to be responsible for their predicament (i.e. an internal-controllable cause, such as contracting a disease), then people engage in cognitive reasoning about why claimants need help. Hence, prioritizing patients for expensive medical treatment may lead to inferences as to the patient's level of responsibility which in turn may lead to perceiving them as more responsible for their situation and thus less likely to be referred for treatment.

The use of patient responsibility in decision-making processes has been shown in medical resource allocation (see Fowler et al., 1994; Furnham et al., 2007; Stanton, 1999; Ubel et al., 2001; Wittenberg et al., 2003). For example, Stanton (1999) found out that personal responsibility for illness influences the allocation of scarce life-saving technology in society. A similar result was found in other research on healthcare decisions, where laypeople assign lower priority to clinical services directed at patients who were to some extent responsible for their illness (Fowler et al., 1994). This phenomenon seems to suggest that, when the cause of an event is controllable, inferences about how responsible the person was for his/her situation are likely to influence the decision-making processes. This reasoning arises from the need to attribute causes to the behaviour of others (Heider, 1958) and affects how we respond to others' social behaviour. For example, when people believe that the cause of an illness is controllable (i.e. the cause is due to a person's behaviour), they tend to show more negative affective reactions, which in turn affects social behaviour (i.e. people show fewer intentions to help), compared to when they believe the cause is not controllable (Corrigan et al., 2003; Lenton et al., 2006; Murphy-Berman et al., 1998; Ubel et al., 2001; Weiner et al., 1988). Hence, if people perceive a potential recipient's behaviour as controllable (e.g. such as taking injectable drugs or having unprotected sex), then they are more likely to judge this recipient as more responsible for their health status (Weiner et al., 1988). In turn, individuals who are perceived as more responsible for their disease's onset may be less likely to receive a favourable medical

recommendation. In contrast, if people believe that the cause of the health condition results from factors outside individuals' control (e.g. such as blood transfusion) then recipients may be seen as more deserving of medical treatment than others because they are perceived as less responsible for their predicament, especially if the treatment is highly expensive or scarce. This is a general cognitive scheme that exists in people's minds (Skitka & Tetlock, 1993) and has been extensively demonstrated within interpersonal relationships (Corrigan et al., 2003; Fowler et al., 1994; Furnham et al., 2007; Stanton, 1999; Ubel et al., 2001; Weiner et al., 1988; Wittenberg et al., 2003). However, this process does not take place in a social vacuum but is modelled by information about social groups from which the recipients come (Tajfel, 1972). For example, if a controllable behaviour is considered the cause of an illness and that behaviour is considered typical of a particular social group, the influence of that behaviour on people's attribution of responsibility for the individual's disease is stronger (Gollust & Lynch, 2011; Gollust et al., 2010; Winter, 2008). This occurs because signalling the cause of illness provides people with useful heuristics for judging responsibility (Weiner et al., 1988). In turn, inferences about individual responsibility may be more biased when they are associated with negative stereotypes activated by the potential recipient's (bad) behaviour (Bodenhausen, 1996; Reyna, 2000). If negative stereotypes activated by the recipient's behaviour are more strongly associated with a particular social group, recipients who belong to that social group are likely to be viewed as more responsible. The few studies that have analysed the relationship between being part of a certain group and stereotypes when it comes to healthcare resource allocation preferences have found minimal effects, primarily because the race factor was explicitly primed, and triggered a motivation to respond without bias (Gollust et al., 2010; Lenton et al., 2006; Murphy-Berman et al., 1998; Plant & Devine, 1998). Nevertheless, the results support the idea that respondents are more likely to hold the recipient accountable when the cause is controllable and that the higher this accountability the higher the possibility of making the recipient responsible for the cost of medical care (Gollust et al., 2010). Following these findings, it is likely that the impact of group membership on individual responsibility perception may occur indirectly through stereotyping processes. Therefore, including group membership and stereotypes can be an important aspect in assessing patient individual responsibility that informs medical decision-making.

Group-based allocation of healthcare resources

A broad and consistent research line on group-based healthcare resource allocation disparities has documented that among minority groups, racialized groups tend to be most affected by the inequitable distribution of medical care (for a review, Major et al., 2018). Correlational studies show that Black people are less recommended for costly medical treatments, such as the treatment of curable cancers (Tehraniifar et al., 2009), antiretroviral therapy (Landovitz et al., 2017), hepatitis C treatment (Vutien et al., 2016), organ transplantation (Sood et al., 2015), and more recently, to receive critical care during the Covid-19 pandemic (Price-Haywood et al., 2020). However, experimental research on the effect of race on healthcare allocation decisions has shown less consistent results (Gollust & Lynch, 2011; Lenton et al., 2006; Murphy-Berman et al., 1998). For example, in a study conducted by Lenton et al. (2006), patients' race did not directly affect who received medical care because Black and White patients were equally likely to be selected for medical care. One possible explanation for this finding is that other characteristics, such as age and gender, came to the fore simultaneously with race during the decision-making process, thus inhibiting the race effect (Macrae et al., 1995). As a result, participants primarily used principles of distributive justice, such as patient responsibility, to allocate health resources. Another possible explanation lies in the fact that the effect of the patient's race may play an additional role during the decision-making process along with other socially relevant (and sometimes stereotypical) information. For example, in Murphy-Berman et al.'s (1998) study, the patient's race influenced the relationship between employment status (i.e. employed vs. unemployed) and medical decisions to the extent that a Black patient was assigned a lower priority compared with a White patient. This difference disappeared when both were described as

employed. Thus, being Black or White may have influenced the evaluator's behaviour, as unemployment may have activated group stereotypic inferences (e.g. laziness), resulting in less favourable outcomes for Black patients.

Indeed, social psychological research on this topic suggests that one of the many explanatory factors for group-based healthcare disparities lies at the level of racial stereotyping (Dovidio & Fiske, 2013). There is a consistent body of research stating that healthcare professionals hold explicit and implicit negative stereotypes associated with racialized groups (Moskowitz et al., 2012; Oliver et al., 2014; Sabin et al., 2008; Sabin & Greenwald, 2012; van Ryn & Fu, 2003). For example, relative to White, Black patients are perceived as less intelligent, at a greater risk for substance abuse and having less adequate social support (Madeira et al., 2022; van Ryn & Fu, 2003). Additionally, providers reacted more quickly to stereotypical diseases, such as obesity or drug abuse when before a Black (vs. White) face, thus proving the existence of implicit stereotyping among doctors (Moskowitz et al., 2012). Moreover, such stereotypes can affect expectations about whether a patient will follow a prescribed treatment (Bogart et al., 2001; Cooper et al., 2012; Green et al., 2007; Oliver et al., 2014; Sabin et al., 2008; Sabin & Greenwald, 2012; van Ryn & Fu, 2003). A study conducted by Bogart et al. (2001), found that patients who had contracted HIV infection as a result of substance abuse (e.g. prior injection drug use) were perceived as less likely to engage in treatment. Also, when the patient was portrayed as Black, they were perceived as even less compliant than when portrayed as a White patient. This suggests that when race is associated with stereotypical behaviour that caused a disease (e.g. substance abuse), it triggers the negative component of the stereotype likely to influence important dimensions of medical care, such as the providers' perception regarding the patient's compliance. Indeed, Madeira et al. (2022) found that exposing medical trainees to behaviours stereotypically congruent with the patient's race decreased the perception of patient compliance when the patient was Black. And this effect was found among those holding higher racial prejudice. As for the White patients, no differences were found. These findings suggest that, if group-based stereotypes affect important dimensions of medical evaluation, such as medical compliance, their effect may occur in other relevant medical dimensions. For example, Black patients may be perceived as more likely to engage in more risky health behaviours (Calabrese et al., 2014). This means that such behaviours are more stereotypical of Black people, which certainly has great potential to bias the entire evaluation process of these patients by physicians, leading them to attribute more responsibility to patients' illnesses (Hamilton, 1979; Reyna, 2000; Reyna et al., 2006; Wittenbrink et al., 1997). See, for example, a situation when a physician believes that black people are typically more sexually promiscuous and, therefore, more likely to engage in unprotected sex. In that case, that physician holds the black patient directly responsible for the disease caused by engaging in unprotected sex. As such, we propose that information about a particular behaviour that led the person to contract a disease should influence medical trainees' perception of patients' responsibility through stereotyping processes. Furthermore, because these controllable behaviours are perceived as more stereotypical of black patients, the influence of controllability of behaviour on the attribution of responsibility is likely to be more detrimental for black patients than for white patients. That is, the influence of controllability of behaviour on the attribution of patients' responsibility for their illness should be moderated by the patient's group membership. Thus, how the controllability of a behaviour influences perceptions of responsibility and lead to biased allocation of scarce medical resources should be conditioned by stereotyping processes and group membership.

Overview of the present research

We propose an analytical model mapping the psychological process underlying decisions to prioritize patients for hepatitis C treatment (see Figure 1). The model draws on the aforementioned theories and research on allocation decisions (Skitka & Tetlock, 1992), attributions of responsibility (Weiner et al., 1988), and intergroup relations (Major et al., 2018; Tajfel & Turner, 1979). The model predicts

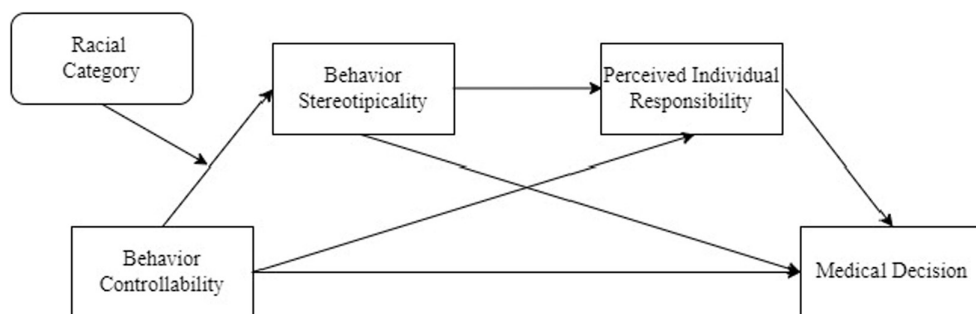


FIGURE 1 The proposed theoretical model for medical decision

that controllable behaviours will be more stereotypically associated with the cause of an illness and that individuals will attribute more individual responsibility to patients who engage in such stereotypical behaviours. Therefore, the perceived stereotypical content of behaviour should mediate the influence of behaviour controllability on the attribution of individual responsibility. Thus, it is likely that the influence of the controllability of behaviour on prioritizing decisions is mediated by behaviour stereotypes and patient responsibility

Moreover, the decision-making process is influenced by social information about patients' group membership, likely to bias the weight of behaviour stereotypicality. If behaviour stereotypicality mediates the relationship between behaviour controllability and perceived responsibility, then individuals should be more likely to bias their judgements about controllability when it is associated with a Black person. In other words, medical trainees should attribute more responsibility to stereotypically Black than to stereotypically White behaviours (Reyna, 2000). Thus, the influence of controllability on behaviour stereotypicality should be moderated by the patient's group membership. This means that the predicted serial mediation between behaviour controllability, stereotypicality and perceived responsibility is moderated by patient group membership (Black vs. White) because the component of stereotypes associated with Black people is likely to trigger predominantly negative inferences.

In sum, we hypothesize that racial category moderates the influence of behaviour controllability (controllable vs. non-controllable) on perceived stereotypicality, such that more controllable behaviours could be predictive of more stereotypicality, especially for Blacks (vs. Whites). Then, we expect the stereotypicality effect on decision-making to be mediated by perceived responsibility, such that the more stereotypical the behaviour, the higher the perceived responsibility. In addition, the higher the responsibility perceived, the lower the prioritization for treatment. Thus, we expect behaviour controllability to predict allocation decisions through stereotypicality and individual responsibility. And we expect that the strength of this mediated relationship will be stronger for Blacks (vs. Whites). Thus, our main assumptions point to a serial mediation model moderated by racial category:

- H1. Behaviour controllability would significantly predict medical decisions, such that patients who contracted the disease in a controllable way will be less recommended.
- H2. The influence of controllability on the recommendation will be mediated by stereotypicality of the behaviour and patient responsibility, such that controllable behaviours will be more stereotypical, and the higher the stereotypicality, the lower the medical recommendation.
- H3. This mediation process will be moderated by the patient's group membership, such that the stereotypicality of the behaviour will be stronger when patients are Black (vs. White).

These predictions drawn on the justice and group perspectives could be useful to understand the socio-psychological factors leading to unequal allocation decisions, which might clarify some previous contradicting findings.

METHOD

Participants

A convenience sample of 232 medical students was invited to participate in the online survey. Following the exclusion criteria defined in the study's pre-registration at OSF (https://osf.io/qfpxr/?view_only=a8e-be28edb434f3b8127e0e4b096d13b), six participants were excluded based on demographic criteria (four with "other nationality" than Portuguese, one with dual nationality (i.e. Cape Verdean and American) and one missing), two participants were excluded for exhibiting outliers in the perceived responsibility dimension, and eleven participants were excluded because they had too short (<3.7 min) or too long (more than 90 min) response times in the survey. The final sample comprised 213 Portuguese White medical students (74.6% female), aged between 18 and 40 ($M = 21.31$, $SD = 3.75$), from seven Faculties of Medicine. Participants were in their first (34.3%), second (8.9%), third (15.5%), fourth (8%), fifth (17.4%) and sixth (15.5%) year of training. A sensitive analysis indicates that this sample size has a power of .39 of detecting of a sequential indirect effect (Schoemann et al., 2017). We used a within-subjects design in which the independent variable was the cause of HCV infection (controllable vs. non-controllable) and the main dependent variable was the decision to recommend medical treatment. The mediating variables were the behaviour stereotypicality and patient-perceived individual responsibility in contracting HCV. The moderator variable was the patient's group membership (Black vs. White).

Procedure

Data was collected via an online survey using Qualtrics. Recruitment was facilitated through social media, server lists and direct contact with medical students' associations from eight medical schools that distributed the online survey through their server lists. The study was conducted between July and December 2020. The procedure was conducted in two phases. In phase 1, the cause of disease contagion and salience of categorization was manipulated and the stereotypicality of behaviour was measured for each target group. In phase 2, participants evaluated the level of patients' responsibility and indicated the likelihood of recommending a patient with each cause of disease contagion.

So, in phase 1, participants read a brief explanation about hepatitis C virus (HCV) and were informed that they would see eight behaviours associated with the causes of HCV contraction with which we manipulate controllability of the disease contraction (controllable vs. non-controllable). We then manipulate the salience of the racial categorization and asked the participants to indicate how typical each behaviour is for Black and White people.

Next, in phase 2, participants indicated how responsible a potential patient could be for each behaviour. Finally, participants indicated how strongly they would recommend a patient presented with each behaviour for HCV treatment. The eight behaviours were presented to participants in the two phases, and each behaviour was randomly presented to participants within phases. Finally, participants provided socio-demographic characteristics, were thanked for the collaboration and were debriefed. The study protocol was approved by a local Institutional Review (no. 177/18). To take part in the study sample, participants should agree to the informed consent, where information regarding the objectives of the investigations and how to contact the principal investigator researcher was available.

Manipulation of behaviour controllability and group membership

The content of the behaviour controllability manipulation consisted of eight behaviours, which were grouped into two distinct factors according to a performed confirmatory factor analysis (see [Supporting Information](#)). The controllable behaviours in contracting HCV included injecting drug use, inhaling drugs (e.g. cocaine), body tattoos, body piercings and unprotected sex. Non-controllable behaviours included

medical and surgical procedures, blood transfusions and occupational context. The eight behaviours were selected based on the clinical characteristics of HCV patients described by Sims et al. (2017). Group membership was salient within participants by varying the order in which participants responded for each target group. Thus, in the Black target condition, participants indicated how much each cause represented a typical Black behaviour, whereas in the White target condition, indicated how much each cause represented a typical White behaviour.

Measures

Behaviour stereotypicality

Based on past research showing that people exhibit negative stereotypes more freely when asked to answer from the point of view of society (societal prejudice) rather than to express their attitudes (individual prejudice; Cox & Devine, 2015; Devine, 1989; Devine & Elliot, 1995; Lima et al., 2019, Experiment 3), participants were asked to indicate, according to the perspective of most physicians, how typical of Black and White people was each behaviour in HCV contraction. Stereotypicality regarding Black and White people behaviours were measured with the following question “To what extent do most physicians see this way of infection as typical of [racial category: White vs. Black people]”, to which participants answered using a 7-point scale, ranging from 1 (not at all) to 7 (totally).

Perceived individual responsibility

To measure the perceived patients' individual responsibility for each behaviour, participants were asked “To what extent a patient with this history of infection can be held personally responsible for his/her situation?”, to which participants answered using a 7-point scale, ranging from 1 (not at all responsible) to 7 (totally responsible).

Medical recommendation

Recommendation for HCV treatment was measured using the question “To what extent would you recommend this patient for treatment of Hepatitis C?”, ranging from 1 (not recommended at all) to 7 (totally recommended).

Analytic strategy

Serial mediation and moderated serial mediation models were estimated using a multilevel analysis in Mplus software (8th version; Muthén & Muthén, 2017); the remaining analyses were run in SPSS 26. Because we manipulated behaviour controllability and group membership within participants, we have a nested database structure in that each behaviour (i.e. each way of contracting HCV) was measured two times (phase 1: Stereotypicality; phase 2: Responsibility and Medical Recommendation) producing 3408 observations at level 1, nested within participants (level 2; $N = 213$). This procedure allowed us to test our hypotheses regarding the serial mediating role of stereotypes and responsibility in the influence of behaviour controllability on medical recommendation and estimate the moderating effect of racial category on the relationship between behaviour controllability and stereotypicality. The correlations for behaviour controllability, stereotypicality, perceived responsibility and medical recommendation for each way of HCV infection can be found in Table 1.

TABLE 1 Correlation matrix, means, standard deviations for all variables ($n = 1600$)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. BC	.63	.48	–						
2. WS	3.49	1.75	.13**	–					
3. BS	3.45	1.74	.19**	.70**	–				
4. PR	3.96	2.27	.70**	.21**	.25**	–			
5. MD	5.70	1.65	-.42**	-.06*	-.12**	-.43**	–		
6. Gender	0.76	.43	.00	.03	.04	-.02	.05*	–	
7. Age	21.42	3.93	.00	.01	-.01	-.01	.12**	-.06*	–
8. Year of training	3.11	1.88	.00	.10**	.03	-.05*	.19*	-.10**	.57**

Note. Gender (0 = Male; 1 = Female); * $p < .05$; ** $p < .01$; *** $p < .001$.

Abbreviations: BC, Behaviour Controllability (non-controllable = 0; controllable = 1); BS, Black Stereotypicality; M, mean; MD, Medical Decision; PR, Perceived Responsibility; *SD*, standard deviation; WS, White Stereotypicality.

TABLE 2 Effects' decomposition of the sequential mediation analyses

Effect	Mediation model			95% CI	
	Estimate	<i>SE</i>	<i>p</i>	Lower	Upper
Total effect	-1.44	.10	.001	-1.61	-1.28
Direct effect	-.84	.11	.001	-1.02	-.65
Total indirect effect	-.60	.10	.001	-.77	-.43
Specific indirect effects					
BC \Rightarrow ST \Rightarrow MD	.01	.01	.558	-.01	.03
BC \Rightarrow PR \Rightarrow MD	-.594	.10	.001	-.77	-.43
CC \Rightarrow ST \Rightarrow PR \Rightarrow MD	-.02	.01	.001	-.03	-.01

Note. Estimates are completely standardized coefficients.

Abbreviations: BC, Behaviour Controllability; MD, Medical Decision; PR, Perceived Responsibility; ST, Behaviour Stereotypicality.

RESULTS

We first tested our hypothesized model predicting a serial mediating role of stereotypically and perceived responsibility in the relationship between behaviour controllability (controllable vs. non-controllable) on participants' medical allocation decisions (model 6; Hayes, 2022). As hypothesized, results showed that the influence of controllability (dummy code: 0 = non-controllable; 1 = controllable) on treatment recommendation was sequentially mediated by behaviour stereotypicality and individual responsibility ($b = -.02$, $SE = .01$, $p = .001$). Table 2 shows the decomposition of the effects of serial mediation. These parameters indicated that the controllable ways of contracting a disease were perceived as more stereotypical. In addition, this stereotypicality was positively related to patients' responsibility for their disease, which predicted lower treatment recommendations. Furthermore, the results also demonstrated a reliable single mediation in that patients contracting HCV in a controllable manner were perceived as more responsible for their situation, which, in turn, was associated with a lower recommendation for treatment.

In addition, our model predicted that information about patients' group membership (Black vs. White) moderates the influence of behaviour controllability on stereotypicality (model 83; Hayes, 2022). The index of mediated moderation was indeed reliable ($b = -.006$, $SE = .003$, $p = .046$). This is because the patients group membership moderated the influence of controllability on behavioural stereotypicality, indicating that although the influence of controllable behaviours on stereotypicality is reliable for both Black ($b = .703$, $SE = .084$, $p = .001$) and White targets ($b = .490$, $SE = .086$, $p = .001$), that influence was stronger for Black (vs. White) targets ($b = .212$, $SE = .093$, $p = .022$). In other words, when participants rated information about Black patients, the indirect serial mediation effect (indirect effect: $b = -.021$,

$SE = .006, p = .001$) was significantly stronger than when they rated information about White patients (indirect effect: $b = -.015, SE = .005, p = .001$). Figure 2 presents the estimated parameters of the moderated serial mediation for each patient's race category.

DISCUSSION

The current study examined how and to what extent conditions of controllability of patient behaviour led to biased prioritization decisions. Specifically, we sought to determine how two different, yet complementary, processes (i.e. justice-based criteria and social categorization processes) uniquely and jointly predict bias in the decision to prioritize patients when healthcare resources are scarce. We proposed from the onset to consider both the literature on models of distributive justice, which has examined the effects of behaviour controllability and perceived individual responsibility on allocation decision-making processes and the literature on group-based healthcare disparities to understand how decisions are modelled by information about social groups. In general, the results supported largely our predictions. The controllability of behaviour affected negatively prioritization for medical treatment, in that participants reported being less likely to prioritize hypothetical patients with controllable ways of disease contraction, such as drug use, unprotected sex and body tattoos and piercings. The effect of behaviour controllability on medical decision-making occurred through perceived stereotypicality and responsibility, such that behaviours that were considered controllable (vs. non-controllable), were perceived as more stereotypical; and the higher the stereotypicality of the behaviour, the more medical trainees attributed responsibility to the patients. Finally, controllable behaviours were more predictive of higher stereotyped behaviours, especially for Blacks (vs. Whites), meaning that the perception of controllable behaviours as more stereotypical is stronger for Black than for White patients.

In summary, people make attributions about the controllability of behaviour that led to inferences about how typical that behaviour is. The more stereotypical a group's behaviour is, the more likely it is that stereotypic inferences will increase the degree of perceived individual responsibility. These inferences about individual responsibility in turn lead to biased responses. And finally, the negative impact of the controllability of behaviour on decision-making is likely to be less favourable if the cause of infection is more stereotypical of Black than of White patients.

Overall, these results are consistent with research on the argument that perceived individual responsibility is a fundamental mechanism for allocation decisions because it is a heuristic that is activated in contingency situations (Skitka & Tetlock, 1993). This attributional process arises from the need to attribute causes to the behaviour of others (Heider, 1958). As such, people infer that, when behaviour is controllable, it is likely to convey more judgements of individual responsibility (Corrigan et al., 2003; Ubel et al., 2001; Weiner et al., 1988). Current findings support this idea suggesting that if medical trainees perceive the cause of hepatitis C to be under the patient's control, they are more likely to judge this patient as more responsible for their situation. This perception of responsibility accounts for bias in

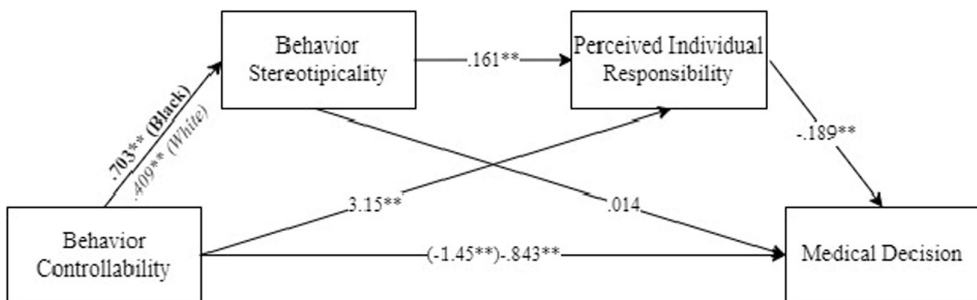


FIGURE 2 Estimated parameter of serial mediation in each target-group. Note: ** $p = .001$

decision-making. Our research provides further insight into how perceptions of responsibility lead to biased decision-making by showing that patients who are perceived as more responsible are less likely to be preferred for scarce medical treatment.

Importantly, the current research elucidates how stereotyping processing and information about patient's group membership may bias medical decision-making through attributional processes, which have not yet been extensively documented. In fact, the current results thus show that when a behaviour that caused a particular illness is, in addition, perceived as more stereotypical of a social group, this information may be used as a basis for judgements of responsibility (Bodenhausen, 1996; Reyna, 2000; Reyna et al., 2006). Yet, the magnitude of the impact of this stereotyping process on responsibility judgements differs as a function of the patient's group membership, being more detrimental for racialized groups. This means that the responsibility heuristics that influence judgement and decisions in contingency situations are influenced by stereotyping processing that results from social categorization (Tajfel & Turner, 1979). Therefore, we propose that the role of controllability in allocation decisions should be related to social categorization processes and cognitive and attributional principles. Thus, our focus on both distributive justice and intergroup relations theoretical approaches helps clarify some existing contradictory findings about race-based inequalities in healthcare allocation decisions (Lenton et al., 2006; Murphy-Berman et al., 1998).

Limitations and future directions

The present study has clear implications for understanding the socio-psychological factors leading to the unequal allocation of healthcare resources (Major et al., 2018). Before mentioning implications, however, it is important to acknowledge several limitations and suggest how future research could address them. First, the patient's group membership manipulation is a key issue. One of the main goals of this research was to analyse how much each of the eight behaviours was stereotypically of Black and White individuals so that we could identify causes that were exclusively stereotypical of Whites or Blacks. The race of each target group was manipulated in a veiled way, within each measure associated with the stereotypical view of each group. This limitation in the procedure was the reason why the effect of target moderation was found only on the path between behaviour controllability and stereotypicality, and not on the other paths. Future research could address this issue with race manipulation using standardized clinical vignettes. Because explicit racial manipulation may underestimate the magnitude of racial bias (Hagiwara et al., 2020; Mathur et al., 2014), future research should assess implicit racial bias in allocation decisions (e.g. medical recommendations).

Second, the association between controllability and responsibility might lead us to speculate about the interchangeability of these concepts. Despite the strong association between behaviour controllability and responsibility, the two are different conceptual representations of an intrinsic, mediating inferential process driven by the need to attribute a cause to the misfortune of others (Heider, 1958). Controllability is the most important determinant of the perception of responsibility (Weiner, 1993; Weiner et al., 1988). However, while the concept of responsibility is closer to the concept of intentionality and free will attributed to a person, the concept of controllability is a property of behaviour. In this sense, there are circumstances in which the behaviour is controllable, but the responsibility is not inferred if there is a moral justification or an attenuating circumstance associated with the controllable behaviour (Weiner, 1993). With this in mind, we suggest that future studies consider the manipulation of controllability and individual responsibility to understand under what circumstances the effect of controllability and responsibility may mitigate medical decision bias.

Finally, the experimental design did not allow us to test the alternative hypothesis regarding the relationship between controllability and stereotypicality of behaviour, and it remains unclear whether the more stereotypic behaviours are also more controllable or whether the more controllable behaviours are more stereotypic of a particular social group. According to Bodenhausen and Wyer (1985) stereotypes can be viewed as judgmental heuristics that simplify tasks involving the evaluation of other people's

behaviours. While the current results support the idea that people rely on stereotypic beliefs about behaviours that are believed to be more common within a specific group, the current design only manipulated controllability and measured stereotypicality. So, future studies should thus consider the manipulation of racial while measuring controllability and perceived responsibility.

Practice implications and contributions to the literature

Taken together, the results show that controllability of behaviour influences recommendations for medical treatment. This influence occurred through a serial mediation process involving the stereotypicality of behaviour (leading to HCV infection) and patient responsibility for their disease. Significantly, this mediation was moderated by the patient's group membership, meaning that the magnitude of controllability influenced the perceived stereotypically more when patients were Black than White. The current study advances in the field of allocation of healthcare resources by incorporating stereotyping processes that convey information in forming responsibility judgements about patients. By doing so, one can better understand cognitive mechanisms underlying the formation of responsibility judgements, which are already known to play an important role in decision-making processes, especially in scenarios with scarce medical resources.

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CONFLICTS OF INTEREST

All authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Datasets and supplemental material used in this research can be accessed at the OSF repository platform: https://osf.io/qfpxr/?view_only=a8ebe28edb434f3b8127e0e4b096d13b

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