

**The Impact of Racist Stereotypes on Dutch Police Officers' Behaviour in Stop-and-Search
Scenarios: a Randomized Study with Deepfake Technology in Virtual Reality**

Meret Asara Paululat (2541688)

Department of Conflict, Risk and Safety. University of Twente.

Psychology (BSc). Bachelor Thesis.

First supervisor: Dr. ir. P.W. de Vries

Second supervisor: drs. Bas S. Böing

Abstract

This study examined the impact of racist stereotypes on Dutch police officers' stop-and-search behaviour in virtual reality (VR) using deepfake technology. It aimed to address the conflicting findings in existing literature regarding the impact direction of racist stereotypes. The study also explored the influence of VR and deepfake technology on perception. Eighty-seven officers participated in a 2x2 experimental design, being presented with the manipulations racist stereotypes, and deepfake. Stop-and-search behaviour was measured within the VR environment, and potential mediators (stereotype threat, user experience) were assessed through a questionnaire. The results showed no significant effect of racist stereotypes on officers' behaviour. Surprisingly, encountering deep fake portrayals in VR reduced officers' inclination to select ethnic minority individuals for stop-and-search. The study highlighted the need to consider cumulative stereotype exposure and refine the experimental designs. It also called for further research to understand the observed tendencies and address officers' fear of being perceived as discriminatory. The analysis of user experience and technology emphasized the importance of maintaining a strong connection between the virtual and real-world, suggesting a new type of technological mediation.

Introduction

In the past, the police have repeatedly been accused of racist tendencies. With political discussions increasingly becoming popular on social media, the perceived pressure on officers has increased, as the police institution's legitimacy is being questioned. This, in turn, is ultimately causing the trust of ethnic minorities in the police to decrease, making this topic more relevant than ever. Under the term ethnic profiling, this topic has been a focus of the European Parliament. Commonly, ethnic or racial profiling describes the discrimination, targeting, or suspecting of a person specified on the bases of their ethnicity, nationality, or religion (European Commission against Racism and Intolerance, 2020). In the police context, this entails officers engaging groups or individuals in control, surveillance, or investigation activities primarily based on ethnicity, nationality, or religion (Council of Europe, 2019). This seems to be specifically relevant in proactive policing whereby action is taken preemptively through measures such as traffic controls or stop-and-search operations. Field officers have to make quick unplanned decisions on which groups or individuals to pick out for further proactive investigations. This spontaneous milli-second process is specifically susceptible to ethnic profiling due to its instinctive nature without much available information to make non-superficial substantiated decisions (Pyle, 2022).

In the Netherlands, specifically Turkish and Moroccan minorities experience police discrimination in such stop-and-search instances (Junger-Tas, 1997). Ultimately, ethnic profiling in the police significantly impacts the lives of affected minorities but such procedural injustices also lead to a shortfall of trust in the police and with that a decrease in police legitimacy and public willingness to collaborate (Tankebe, 2021). This detrimental issue of ethnic profiling was also officially recognized by a court ruling the Dutch military police guilty of ethnic profiling. With the rise of the Black Lives Matter movement, public criticism of non-profit organizations like [amnesty.nl](https://www.amnesty.nl), and debates on social media the Dutch public interest in this topic significantly increased in recent days (Carney, 2016). On the one hand, it appears that this public discourse has brought a lot of necessary attention to the topic but on the flip side, it left officers confronted with harsh and sometimes false accusations against them. With headlines like „The Netherlands' disgrace: racism and police brutality“ (Nieuwenhuis, 2015) the sentiment of a racist police that officers have been confronted with is continuously reinforced.

This „racist cop“ stereotype entails officers disproportionately targeting ethnic minorities unnecessarily using coercive policing tactics on them (Mccarthy et al., 2021). While there is research pointing towards racist beliefs spread among officers or even institutional racism as a sole cause for the ethnic discrepancies in stop-and-search scenarios, there might be other factors contributing to the problem. Current U.S. American literature suggests that the racist stereotype about the police might impact officers' behaviour in stop-and-search scenarios. However, in recent literature, there is an

ongoing debate about the direction of this impact. This persistent racist stereotype about the police can lead to more ethnic profiling behaviour and coercive policing among officers (Trinkner & Goff, 2019). Whereas the opposing party concluded that the racist stereotype leads officers to be more fearful in stop-and-search scenarios worrying to conform to this stereotype ultimately leading to more withdrawn behaviours, potentially even leading to officers' unwillingness to participate in relevant training (Mccarthy et al., 2021) (de Vrijs et al., 2023).

Due to the severity of ethnic profiling, many interventions have been developed amongst which, VR seemed specifically promising; however, to date, no studies have focused on the effects of technological environments. Conversely, this study aims to bridge this gap in the literature by further exploring the impact of racist stereotypes on police behaviour in stop-and-search scenarios in hopes of ultimately contributing to the reduction of ethnic profiling among the Dutch police. This study will be conducted in a VR setting additionally utilizing the technology of deep fake. Due to the lack of literature regarding the utilization of VR deep-fake in experimental policing research, this study will also take the opportunity to further explore how the technology impacts the perceptions of the impact and with those experimental outcomes hopefully highlight the added value of deep fake as it allows to study police officers' responses to different individuals while keeping all everything else constant.

Theoretical Framework

Stereotypes

Stereotypes generally can be described as commonly known and widespread fixed but oversimplified ideas about certain people. Such stereotypes can evoke a variety of different reactions in those affected. In social psychology stereotypes have been known to be harmful for decades (Pennington et al., 2016). One specific phenomenon consequential to stereotypes is called stereotype threat. Said "stereotype threat" occurs when members of a certain group worry that they may confirm unfavourable preconceptions about their group. Their performance in tasks connected to the stereotype may be hampered by this worry, producing inadequate work or worse outcomes (Spencer et al., 2016). This phenomenon was first described by Steele and Aronson (1995) in the academic performances of African American students. Since it has been well-established in research replicating this phenomenon across many fields (Casad & Bryant, 2016).

Contrastingly, some individuals react oppositely to what the stereotype threat describes. Specifically, those individuals become aware of the stereotype and purposefully do the exact opposite and do everything in their power to not conform to it. This opposing reaction is called stereotype reactance. Stereotype reactance can ultimately cause anger but also fear and avoidance. Police officers are constantly exposed to stereotypes about them being racist and ethnically profiling citizens in the media and their daily lives. Thereby past research suggests that such racist stereotypes are very likely to evoke some sort of response in officers' work behaviour specifically their stop-and-search

behaviour. It appears that such stop-and-search scenarios are most vulnerable to evoking reactions to racist stereotypes as they call for far-fast decisions with little information (Home Office, 2022).

In such stop-and-search scenarios, officers have reported worrying about being perceived as racist. However, it is not known how this change in behaviour might look in practice. Past studies have voiced the concern of racism in the police becoming a self-fulfilling prophecy (Trinkner et al., 2019). This might be an indication that the fear of stereotypes may significantly contribute to the explanation of how racist stereotypes affect enforcement actions (Mccarthy et al., 2021). However, there hasn't been any rigorous scientific investigation of the part stereotype threat plays in the connection between racist stereotype and stop-and-search behaviour.

Stop-and-Search Behaviour

While it is unknown how the stop-and-search behaviour is impacted by racist stereotype there are past studies that suggest potential directions. Overpolicing is the term used to describe the excessive and disproportionate use of law enforcement in some areas, particularly those that are mostly made up of marginalized groups like racial or ethnic minorities. Police personnel in these locations are subjected to increased surveillance, stops, arrests, and use of force, sometimes without justification. This typically also leads to many negative consequences for those affected. Some studies even suggest that over-policing ethnic minorities lead to lacking feelings of security, distrust in the justice system, and higher crime rates (Johnson et al., 2022).

Contrastingly, under-policing is the practice of law enforcement authorities providing insufficient levels of security, compliance, or intervention in particular neighbourhoods or communities. While both over-policing and under-policing are very different practices both have negative consequences. Sluggish emergency call responses, inadequate inquiries into reported crimes, or a failure to take proactive steps to deter crime can ultimately cause the afflicted minorities to lack feelings of security and foster distrust related to higher crime rates. Both policing reactions cause significant damage to minorities and officers themselves (Johnson et al., 2022).

Ultimately changes in stop-and-search behaviour can have severe consequences for all involved parties. However, there are many reasons for changes in Stop and search behaviour. For instance, past research suggests that over-policing as well as under-policing can be caused by bias and discrimination, the war on drugs, structural inequality, and lack of community policing and trust (Deuchar et al., 2019). However, another influencing factor can be stereotypes and the concept of stereotype threat (Trinkner et al., 2019). While the prevalence of stereotypes in media and the daily lives of officers has grown significantly the exact impacts on their stop-and-search behaviour remain unknown (Gauthier & Graziano, 2018). However, considering Trinkners (2019) framework it is to be expected that officers change their stop-and-search behaviour according to the stereotypes held about them. Because the most prevalent racist stereotype about the police includes aggressive, hostile

and more vigilant policing might be expected that racist stereotypes lead to an overpolicing stop-and-search behaviour mediated through the concept of stereotype threat as seen in Figure 1.

Technology

It is important to understand how the utilized technology impacts the results of the study to account for the potential impact of the VR deepfake technology on perception. Generally, virtual reality as a tool for training and research in the police context has been on the uprise recently. Not only is it theorized that VR can recreate hyperrealistic scenarios from everyday police work to conduct studies in a safe and controlled environment but it has also been proven that virtual reality can improve police training significantly (Kleygrewe et al., 2023).

Especially with sensitive topics in police work using VR environments for research or training is said to be a big opportunity (Fox et al., 2009). Additionally, this study utilizes a deep-faked VR environment. Deepfakes are artificially crafted media in which a person in an existing image or video is replaced with someone else's likeness (Kietzmann,2020). In a VR setting, this brings along the opportunity of creating identical experimental conditions while simultaneously changing the face of someone. In the context of investigating racism, ethnic profiling, and stereotypes this is a crucial development as it is theorized to improve the validity of results drastically due to the elimination of variation in mimics, gestures, and backgrounds causing changes in behaviour instead of the ethnicity of the citizen's officers interact with (Fox et al., 2009).

However, when working with technologies such as VR and deepfake it is crucial to understand how the technology impacts the perception and actions of its users. According to the theory of technological mediation, technology actively mediates social structures, interpersonal connections, and human behaviour through design, functionalities, and affordances of technological tools that can shape the way individuals think, act, and engage with the world (Fox et al., 2009). It stresses the reciprocal interaction between technology and society. Technology is thereby described as an active agent, not merely a tool or neutral item (Kyrre & Crease, 2015). The theory consecutively highlights how technology transforms culture, communication, and social interactions rather than just being a passive instrument utilized by individuals. The idea emphasizes the different ways in which technology mediates or interferes with human existence. It contends that technology serves as a conduit between individuals and their social contexts, influencing how people view, engage with, and interact with the outside world. Social norms, power dynamics, and communication patterns can all be changed by technological mediation whereby it is crucial to consider such a potential mediation in the context of this study design (Kyrre & Crease, 2015).

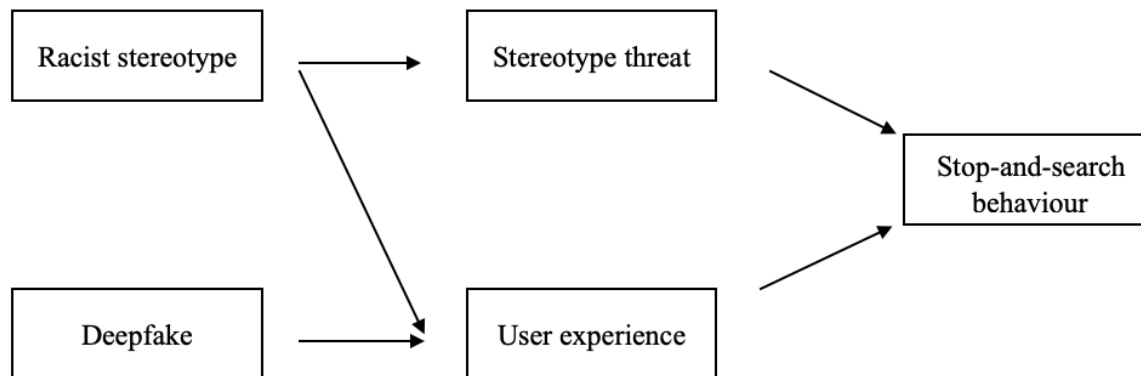
Nonetheless, a deepfaked VR environment is a new technology and subsequently calls for an additional type of mediation. VR does not mediate between the outside world and the individual but rather between metaverse or alternate reality and the individual while simultaneously aiming to

replicate the outside world. Ultimately this new technology might mediate between individual and alternate reality but simultaneously enables its user to stay in reality and with that expand one's experiences. However, there has not been rigorous theoretical investigation of this type of mediation (Niculescu-Dincă, 2021).

To gain insight into the degree of mediation, the concept of immersion has been utilized in past research (Barbot & Kaufman, 2020). It is a way to measure user experience. Immersion describes psychological and cognitive mechanisms responsible for producing a sensation of immersion in a virtual or simulated world. It focuses on the elements that help people have a realistic experience in various settings. Past research has found the elements of presence, engagement, enjoyment, and embodiment to be of specific importance when analysing immersion (Cornet & Van Gelder, 2020). Presence refers to the sensation of "being there", completely engrossed in and linked to the virtual world, seeing it as real and tactile, in the context of virtual reality or immersive experiences. Engagement describes individuals' involvement, interest, and attention in a task or event. In the context of virtual reality or immersive experiences, it refers to the degree to which users actively engage with, communicate with, and react to the virtual world. Furthermore, enjoyment describes the pleasant emotional state or pleasure received from a task or event. Lastly, embodiment aims to capture the experience of possessing and having control over an avatar or virtual body inside of a virtual world. It entails having the impression that one's virtual self is an extension of themselves, which heightens one's sensation of presence in and identification with the virtual environment. Ultimately this study will look at the user experience representing the degree of immersion to consider the aforementioned factors to account for a potential mediation see Figure 1 (Cornet & Van Gelder, 2020). However, due to the lack of literature and previous research on the impact of deepfake technology specifically, its relationship with user experience and stop-and-search behaviour will be analysed more holistically.

Figure 1

Conceptual Mode



The Current Study

In the quest of understanding the impact of racist stereotypes on Dutch police officers' behaviour in stop-and-search scenarios, a deepfake technology in virtual reality was utilized. The current study included two manipulations. The first is the 'Racist stereotype'. The experimental group is being confronted with a video of police officers being accused of racism. The control group is being shown a racism-unrelated video. This was included to activate the already present Racist stereotypes the public holds about officers and to monitor the potential effect on the previously introduced concept of 'Stereotype threat'. The second manipulation is the 'Deepfake'. This determines whether the VR environment includes a person from an ethnic minority or only individuals with Western physical appearances. Ultimately, the dependent variable 'Stop-and-search behaviour' was measured by the behaviour the police officers show in the VR environment in hopes of understanding officers' real-life behavioural reactions. This experiment was followed by a questionnaire including items regarding the 'User experience' amongst other questions. These questions were included to account for a potential technological mediation.

H1: The Racist stereotype influences Dutch police officers' Stop-and-search behaviour; specifically, exposure to the Racist stereotype causes more overpolicing.

H2: The police officers' level of Stereotype threat explains the relationship between the Racist stereotype and Stop-and-search behaviour.

H3: The police officers' level of User experience explains the relationship between the Racist stereotype and Stop-and-search behaviour.

RQ1: How do the VR Deepfake technology and User experience affect Stop-and-search behaviour?

Methods

Participants and Design

96 police officers were gathered through purposive sampling utilizing a LinkedIn post. All police stations across the Netherlands were invited to reply to the conduction of a social psychological experiment using VR-Technology (see Appendix A). Before analysing the data, several participants had to be removed from the dataset to obtain valid results. More specifically, from the initial 96 police officers, nine participants were removed because their reported code associated with the checked person in the VR was not in line with the allocated condition. Therefore, after deleting invalid participants, eighty-seven Dutch police officers (65M, 22F, $M_{age} = 35.05$, $SD_{age} = 9.87$) represented the final sample for analysis. The officers or detectives had to have Stop-and-search experience to be included. The working experience was assessed on a scale ranging from 1 to 5 where 1 indicates a working experience of less than 10 years, 2 equals 10-20 years, 3 means 20-30 years, 4 is 30-40 years and 5 represents a working experience of more than 40 years. Based on this scale, the police officers had an average working experience of 1.87 ($SD = 0.96$). Participants worked at the police stations in Amsterdam, Rotterdam, Utrecht, Zwolle, and Wageningen.

Procedure

Before VR-Environment Phase

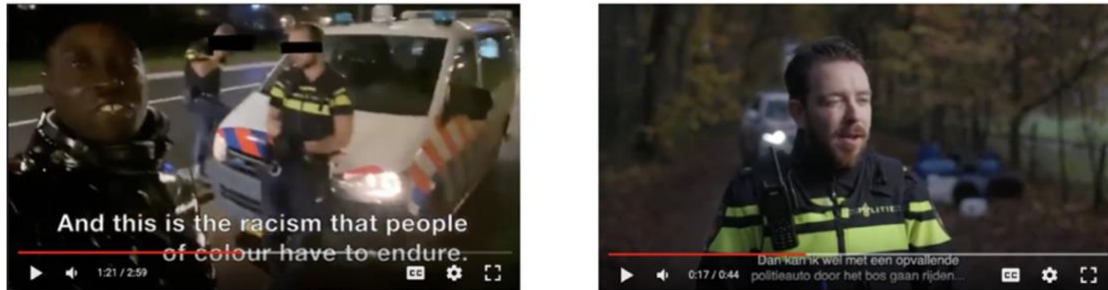
For the data collection, at least two researchers travelled to the respective police stations within the Netherlands. Upon arrival, two or three stations for the experiment conduction were set up, including a laptop, Oculus VR goggles and headphones. All participants were given a short introduction to the structure of the experiment. The exact aim of the study was not disclosed in advance. Participants were told that the study investigated how public opinion influences police officers. Next, participants were provided with a digital informed consent sheet (see Appendix B) as well as a short pre-questionnaire to assess demographic information on a laptop using Qualtrics XM as part of the following questionnaire.

Thereupon, the participants were shown a short video with headphones on (Figure 1). Half of the participants saw a video namely the Stereotype threat manipulation from YouTube posted by the account *Godgiven* depicting Dutch officers being accused of ethnic profiling. The video showed a black individual videoing himself while talking to two white police officers in the Netherlands. Concretely, he is videoing the officers while calling them racist and elaborating that this is normal policing practice in the Netherlands. He speaks loudly into the camera explaining that he was pushing two rented bicycles which would not have been suspicious if he was white. The video is three min long and in English. The other half of the police officers were shown a racism-unrelated video. This

video stemmed from the social media platform Twitter and was posted by *KombijdePolitie*. It depicts a police representative sitting in a car explaining recent successes. It is 0.44 min long and in Dutch.

Figure 1

Stereotype Video and Stereotype Unrelated Video



Subsequently, all participants put on the VR goggles and headphones. Before entering the VR-Environment, the researchers explained that one can select a person by simply staring at them for two seconds. This was also explained again in a short introduction in the VR-Environment itself. Moreover, it was explicitly stated that it is not required to choose a person.

VR-Environment

Half of the participants were presented with a VR-Environment in which the person sitting on a scooter has the facial characteristics of a white person. The other half of the police officers were shown the version of the Deepfake VR-Environment in which the person on the scooter possesses non-western facial characteristics. These were applied to the originally western-looking person using Deepfake technology. The participants virtually find themselves in the financial district of Amsterdam. Surrounding them, four men are standing at differing distances. One man sitting on a scooter, one man on his phone, a man in a suit and a man just looking around. In the background, there are typical street noises, pedestrians, cyclists, and cars.

After having selected one of the four individuals, or if the participant decided not to select anyone, the VR part was finished. Then, the police officers selected ‘feedback’ and then received a code depending on which person was chosen which then had to be indicated in the following questionnaire. The officers who did not select a person did not receive a code and subsequently indicated that in the questionnaire. The codes belonging to the individuals can be found in Figure 2, respectively.

Figure 2

Persons Overview



Person 1

Person 2

Person 3

Person 4

In the following, the people depicted in the VR are going to be referred to as Person 1, Person 2, Person 3, and Person 4. Importantly, Person 1 possesses facial characteristic associated with a migration background in the Deepfake condition, and western facial characteristics in the original VR version in which Deepfake technology was not used. All other individuals remain the same in both VR versions.

Post VR-Environment Phase

After finishing the VR-Game, participants conducted the main part of the questionnaire. The first questions were asked regarding the participant's motivations and intentions underlying the decision to choose or not choose a person (i.e., "It is possible that you addressed someone in the simulation. If so, what do you think was the reason for this?"). Thereupon questions regarding User-experience, Self-legitimacy, Stereotype threat, Workplace racial anxiety, Force support, Stigma feelings, and Training willingness were asked. After responding to all items of the questionnaire, the participants were asked to accept a digital post-consent form (see Appendix C) and finally, a thank you notice was displayed. Upon completion of the questionnaire, participants were offered further explanations with regard to the true nature of the study. Additionally, there was space for debriefing and open conversations.

Measures

Stop-and-search behaviour

The police officers' Stop-and search behaviour was operationalised by applying specific criteria to categorise the VR behaviour of police officers as either underpolicing (0), neutral policing (1) or overpolicing (2), building the Stop-and-search behaviour variable. This distribution was chosen based on the previously discussed controversy of whether the Racist stereotype provokes more passive or active policing. Ultimately, one police officer showed underpolicing, 46 showed neutral policing and 40 showed overpolicing

In the present study, all items could be answered on a 5-point Likert scale, ranging from "Strongly disagree" (1) to "Strongly agree" (5). A list of all items used for this study and the reliability coefficients of the scales can be found in Appendix A.

User experience

Seven items measuring participant's quality of User experience to test for a potential technological mediation were incorporated based on the scale utilized in the unpublished doctoral thesis of Böing. Consistency measures were calculated for this scale and revealed a Cronbach's alpha of .78 and a Guttman's lambda2 of .80. An example Item is "During the simulation, interaction with the other people felt realistic."

Stereotype Threat

A five-item scale was used to determine the police officers' perceived Stereotype threat. For Example, the items contain statements like "I worry that people may think of me as racist because I am a police officer." The scales' reliability was assessed, suggesting acceptable internal consistency based on Cronbach's $\alpha = .78$ (n=87). Since Cronbach's Alpha is vulnerable to a low number of items, Guttman's lambda2 was determined, suggesting a high degree of internal consistency with a Guttman's lambda2 of .82. Therefore, the scale chosen represents a reliable measure to determine the police officers' perceived Stereotype threat.

Open Questions

To gather qualitative insights, the questionnaire included several open questions. First, after leaving the VR-Environment the police officers were asked to continue filling in the questionnaire. Here, they were asked about their motives and reasons for why they did or did not select a person in the VR. The open questions were: "It is possible that you addressed someone in the simulation. If so, what do you think was the reason for this?" and "If you did not address anyone, what do you think was the reason for this?". Secondly, to give additional information about the User experience regarding the VR-Environment, police officers answered the question "How do you feel about the VR environment? Explain the extent to which you felt it was realistic and reflected your actions in real life (please explain why)". Moreover, to gather qualitative insights on how the police officers feel emotionally affected by the publicity all around the topic of institutional racism, they could answer the question "Would you tell us a little more about whether, and if so, in what ways you, as a police officer, feel emotionally affected by the public debate about structural racism in policing?".

Training Readiness

To find out how willing the police officers are to participate in training to better handle racist accusations, they were asked "Within the program 'Police for everyone', training is offered, which provides tools on how to deal with Racist stereotypes. To what extent are you willing to participate in this type of activity?". This question could be answered on a 5-point scale ranging from "very willing" to "not willing at all".

Data Analysis

The collected data was analyzed in Rstudio using R in version 4.2.0 (RStudio Team, 2023). Prior to concrete investigations, the dataset was cleaned and ordered. Participants were put in the correct categories in cases where mistakes occurred and those who could not be allocated to a condition were taken out. Followingly, means and standard deviations of all concepts including Stereotype threat and User experience were calculated. Additionally, Cronbach's alpha and Guttman's lambda were analyzed for all scales. Thereafter, a manipulation check was conducted with t-tests in R for Stereotype threat and User experience. Thereupon, the outcome variable Stop-and-

search behaviour was categorized by hand based on the answers to the open questions. Thereby Stop-and-search behaviour was classed as over-policing, under-policing, or neutral-policing based on the availability and strength of reasoning for selecting, talking to, or checking someone's ID. This variable was named SAS. Additionally, the variable PSAS was created to include an additional way of measuring Stop-and-search behaviour which constituted the person that was selected.

Followingly, an overarching correlation analysis including all concepts and variables was conducted. As the next step, a multivariate ANOVA was conducted testing for potential associations while ruling out mediations or moderation in terms of answering the research questions. To additionally gain further insight into the direction and significance of the relationships of the Person selected (PSAS) variable with the conditions, a multinomial regression was conducted.

Lastly, a thematic analysis was used to analyze the open question regarding User experience to gain a better understanding of the impact of the technology. The primary objective was to develop separate themes based on the responses of the participants to offer broad perspectives on the influence of the utilised technology. There, the theme analysis followed the six-step paradigm of Braun and Clarke (2006).

Results

Investigating the impact of the manipulations and understanding the differences between the conditions the average User experience score was 2.54 ($M = 2.54$, $SD = 0.55$). For the condition with a Racist stereotype and Deepfake manipulation, the average score was 2.47, for the condition with a Racist stereotype and no Deepfake manipulation was 2.52, for the condition without a Racist stereotype and with Deepfake manipulation was 2.5, and for the condition without a Racist stereotype and without Deepfake manipulation was 2.64.

Correlation analysis revealed a substantial negative correlation between the presence of Deepfake and the selection of Person 1 ($r = -.24$), indicating that participants were less likely to choose Person 1 in virtual Stop-and-search situations when encountering the Deepfake version of the VR-Environment, which portrayed Person 1 as an ethnic minority. In contrast, there was a significant positive association between Deepfake and the selection of Person 2 ($r = .36$). Additionally, User experience showed a negative correlation with Self-legitimacy ($r = -.26$), indicating the importance of high Self-legitimacy for a better User experience. Furthermore, a correlation was found between User experience and neutral policing (SAS0) ($r = .24$), suggesting a potential impact of a high User experience of the VR on recorded behaviour. Lastly, User experience was highly correlated with willingness to participate in training ($r = .32$). No correlation was found related to Stereotype threat.

Main analysis

A MANOVA was conducted with Deepfake and Racist stereotype, on various outcome variables including the Stop-and-search behaviour, Stereotype threat, Self-legitimacy, User

experience and Training willingness. The analysis revealed non-significant effects for the main factors of Deepfake (Wilks' $\Lambda = 0.12$, $F(8, 76) = 1.16$, $p = 0.33$) and condition (Wilks' $\Lambda = 0.062$, $F(8, 76) = 0.62$, $p = 0.75$). Additionally, the interaction between Deepfake and Racist stereotype was not significant, along with all other variables (Wilks' $\Lambda = 0.08$, $F(8, 76) = 0.89$, $p = 0.52$). According to these results, Stop-and-search behaviour, Stereotype threat or User-experience were not significantly impacted by either the encounter with the racial stereotype in a film or the exposure to an ethnic minority in the VR environment. As a result, each of the three assumptions must be disproven. It is important to note that the development of the Stop-and-search behaviour variable based on the actions of the police officers in the VR may have limits in accurately depicting the actions of the police officers.

Subsequently, the multinomial logistic regression analysis with Person selected (PSAS) showed no significant effects of Deepfake on PSAS ($\beta = 0.086$, $p > .05$), Racist stereotype on PSAS ($\beta = 0.715$, $p > .05$), and the Deepfake:interaction on PSAS ($\beta = 0.202$, $p > .05$) for Person 1. Similarly, for Person 2, Person 3, and Person 4, there were no significant effects of Deepfake, Racist stereotype, or the Deepfake:interaction on PSAS (all p -values $> .05$).

While not statistically significant, it is worth mentioning that a one-unit increase in the Deepfake variable was associated with a 1.09 increase in choosing Person 1 compared to the baseline category. The odds of selecting Person 2 increased by approximately 724,830.27 when being in the condition with Deepfake manipulation. These findings imply that police officers would be far more inclined to select Person 2 over Person 1 if they saw an ethnic minority as Person 1 in the VR environment. This result is consistent with correlational analysis and qualitative insights that had previously revealed that even passing contact with someone from a minority ethnic group might prevent checking someone with a migration background and cause the focus to shift to Person 2.

Table 1*Overview of Variables with Means, Standard Deviations and Correlations*

Variable	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>
1. Deepfake	0.53	0.50												
2. Racist stereotype	0.47	0.50	.01											
3. Age	35.05	9.87	-.18	.03										
4. Work experience	1.87	0.96	-.03	.08	.78**									
5. User experience	3.46	0.56	-.08	-.15	-.03	-.20								
6. Self-legitimacy	4.23	0.42	.08	-.12	-.15	-.26*	.25*							
7. Stereotype threat	2.57	0.76	.06	.20	.06	.09	.13	-.05						
8. Person 1	0.51	0.50	-.24*	.20	.02	-.11	-.05	-.06	-.07					
9. Person 2	0.13	0.33	.36**	.29**	-.07	.05	.05	.01	-.02	.01				
10. Person 3	0.14	0.35	.04	-.11	.05	.09	-.03	.15	.01	-.11	-.20			
11. Person 4	0.14	0.35	.04	.16	-.12	-.02	-.02	-.06	.01	.10	-.26*	.05		
12. No selection	0.09	0.29	-.10	-.06	.12	.04	.10	-.02	.13	.04	-.09	-.23**	-.32**	
13. Stop-and-search behavior_0	0.01	0.11	.10	.11	.18	.24*	.02	-.06	-.08	.07	.01	.15	.11	-.04

Note. The thirteen relevant variables are depicted with respect to mean (*M*), standard deviation (*SD*) and respective correlation values. Significance levels for correlations are defined at $p < .05$ (*) and $p < .01$ (**).

Thematic Analysis

Lastly, a thematic analysis of the open question regarding User experience with 71 answers was conducted. The thematic analysis, followed Braun and Clarke's (2006) six-step paradigm, involving systematically understanding and interpreting themes in qualitative data. It begins with familiarization and immersion in the data, followed by coding to identify patterns. Initial themes are generated, reviewed, defined, and named, leading to a final report that presents the themes with supporting evidence. This approach provides a rigorous framework for uncovering meaningful insights in qualitative data. Therin, 7 major themes of officers' perceptions of the technology emerged (see Table 2). Each theme was divided into 0 to 2 Codes, each with corresponding 0 to 3 Sub-codes. Each answer could have multiple themes. In Appendix C, full answers can be found.

Table 2

Themes of Officer's Thoughts and Opinions

Theme	Codes	Sub-codes	Example of theme	N
Feelings	Natural	1. Realistic	“People in real life naturally react to your nonverbal communication “	31
		1. Interrupted		6
	Distorted	2. Contradiction		14
		3. unrealistic		6
Actions	Own action			3
	Others' actions		„I don't immediately act the same way I would normally act on the street “	8
Problems VR	Distance		„I felt I was very close to the person on the scooter „	6
	Bugs			2
	Answer options			4
Description			„Busy and urban environment with many different people “	13
Enjoyment			„Fun and very nice“	4

Usefulness	„Think a good way of training and making yourself aware“	14
Other	„I would mimic some larger simulations and recreate more stress situation“	3

Note. The officer’s thoughts and opinions are illustrated in terms of seven themes. Codes are given for the three themes “Feelings”, “Actions” and “Problems VR” while subcodes are given for “Natural” and “Distorted”. Examples are provided verbatim and the frequency is depicted for each theme and code.

Feelings

The theme of Feelings (N,57) was identified in the data. This theme was divided into two main codes namely, Natural (N, 31) describing the environment as feeling natural, and Distorted (N, 26)., describing the environment as feeling unnatural. This theme with its two main codes turned out to be the most common one and the clearest in its distribution. It describes participants elaborating on how they felt during the VR. The code Natural was composed of one subcode called Realistic (N,31) which was allocated in cases where participants described the environment as very realistic. An example of this was “Very realistic, multiple different people “. The code Distorted was made up of three subcodes. Interrupted (N,6) describes instances where participants were reminded of the real world. Contradiction (N,14) describes a potential partial immersion given that participants while reporting feeling immersed were reminded by something that the environment was still a simulation. Lastly, Unrealistic (N,6) describes participants finding the VR environment unrealistic in some way. This could mean noticing things in the VR environment that stood out as different to the real world such as people behaving different in the VR. Participants mentioning the VR being unrealistic might be only partially immersed based on their comment describing being reminded of the differences between the VR and the real world.

Actions

The next theme identified was Actions (N,11) consisting of the main codes' own actions (N,3) referring to one’s own actions as unrealistic and Others’ actions (N,8) referring to other actions as unrealistic. An example item was „I don't immediately act the same way I would normally act on the street “. This indicated participants seeing the people in the Vr more as actors than as real-life humans to interact with potentially highlighting that to some the VR had a game character.

Problems with VR

Another theme that was identified is Problems with VR (N,12). One example of this was „I felt I was very close to the person on the scooter”. This theme consisted of three codes, distance (N,6) indicating issues with proximity in the VR, bugs (N, 2), and lacking answer

options (N,4). Participants receiving this code means that they encountered some sort of technical issues clearly suggesting impaired immersion.

Description

The main theme Description (N, 13) was identified describing participants simply describing the environment in the open question. An example item was „Busy and urban environment with many different people “. This code highlighted that some participants experienced a level of immersion where they described the simulation as if it was real.

Enjoyment

Another theme identified was the theme of Enjoyment (N, 4) describing how much fun participants found the VR. An example item of this was „Fun and very nice“. Receiving this code meant the participants had a good time conversely making them more likely to commit to the experience, thus improving potential for immersion.

Usefulness

The main theme Usefulness (N, 14) was identified, describing participants stating how useful they find the VR. An example item was „Think a good way of training and making yourself aware“. Participants receiving this code did most likely see a higher purpose in the VR and with that found it more helpful.

Other

Lastly, the theme Other (N, 3) was identified for any user input that did not fit any other theme. An example of this was „I would mimic some larger simulations and recreate more stressful situation“. This code covered all additional sentiments that were not matching the other coder but still deemed as insightful.

The explorative thematic analysis of User-experience highlights the importance of the reoccurring reoccurring codes of contradicting and describing. On the one hand, contradicting this indicated a partial immersion given that participants while reporting feelings emerged and were reminded by something that the environment was still a simulation. On the other hand, the code describing highlighted that some participants experienced a level of immersion to where they described the simulation as if it was real.

Discussion

Research suggests that racist beliefs and institutional racism may contribute to ethnic disparities in stop-and-search scenarios. The impact direction of the Racist stereotype about the police on officers' behavior in these encounters is debated. Some argue it leads to more ethnic profiling and over policing, while others claim it makes officers fearful and leads to underpolicing (Mccarthy et al., 2021) (Trinkner et al., 2019). This study aimed to bridge the impact direction gap in the literature by further exploring the impact of Racist stereotypes on police behaviour in stop-and-search scenarios

in hopes of ultimately contributing to the reduction of ethnic profiling among the Dutch police. The main hypothesis, being that Racist stereotype influence Dutch police officers' Stop-and-search behaviour, can be rejected based on the insignificant results. No significant differences between the conditions suggest that the video manipulation showing the Racist stereotype did not make a difference in officers' Stop-and-search behaviour. Secondly, the study investigated the hypothesis that police officers' level of Stereotype threat explains the relationship between Racist stereotype and Stop-and-search behaviour. No significant associations were found, which indicated Stereotype threat does not explain the relationship between the Racist stereotype and Stop-and-search behaviour. Thirdly, the study aimed to understand whether or not the police officers' level of User experience explains the relationship between the Racist stereotype and Stop-and-search behaviour. Accordingly, no associations were found, whereby the hypothesis can be rejected. However, a correlation between User experience and Self-legitimacy as well as between User experience and Willingness to participate in training was found.

Additionally, this study focused on better understanding the impact of VR and Deepfake technology. In this regard, it was found that contradiction within participants' opinions and perceptions was of high importance. Many participants said they found the VR very realistic but at the same time called it a simulation. Moreover, many simply described the environment as if it is real which might indicate immersion. Furthermore, it was found that participants did not notice the Deepfake technology as indicated by the t-test coming up insignificant making this technology viable for future research. While the Deepfake could not be detected, the presence of the Deep faked ethnic minority was shown to be important. In the correlation analysis a substantial negative correlation between *deep fake* and selecting Person 1, the ethnic minority was shown while simultaneously Deepfake and Person 2 had a significant positive correlation. This might indicate some sort of avoidance behaviour towards the ethnic minority person. This same tendency was also reflected in the multinomial regression however p-values were insignificant.

Main Findings

The findings of the study indicate that confronting police officers with Racist stereotypes did not have a significant effect on their Stop-and-search behaviour. This contrasts with the initial theoretical expectation, which proposed that accusations of racism could become a self-fulfilling prophecy and influence enforcement actions (Goff, 2019). The theory of Stereotype threat, where individuals act in line with stereotypes about them, suggested that confronting officers with stereotypes would impact their behaviour. However, some researchers hold contrary opinions, suggesting that when stereotypes are overtly presented, individuals may exhibit stereotype reactance and purposefully act in opposition to the stereotype (Hakim et al., 2017).

Exploring potential reasons for the discrepancy, one explanation could be that the manipulation of showing the stereotype video was ineffective, supported by the non-significant results. This suggests that Racist stereotypes may not be directly relevant to the outcome behaviour in this context. Another interpretation could be that police officers are constantly confronted with such stereotypes in their daily lives, rendering video manipulation less impactful as everyone experiences a similar level of exposure to Racist stereotypes regardless of watching the video. This interpretation aligns with previous research highlighting the prevalence of stereotypes in officers' everyday experiences (ACLU, 2019). This might be explained by the theory of Chronic Stereotype threat, describing the longterm, continual experience of Stereotype threat that people from stigmatized groups may encounter. Chronic Stereotype threat is continuous and pervasive, affecting several elements of a person's life, in contrast to acute Stereotype threat, which only happens in certain circumstances (Woodcock et al., 2012). Additionally, the limited number of participants in each condition could contribute to the lack of clear significant differences. However, even though no effect was found that does not mean that an effect does not exist at all.

These results have theoretical implications, suggesting that it is not the immediate confrontation with stereotypes but rather the recurring exposure in everyday life that may influence outcome behavior (Hakim et al., 2017).

The discrepancy with the initial theoretical expectations may be attributed to ineffective video manipulation or the continuous exposure to stereotypes in officers' daily lives (Hakim et al., 2017). These results suggest the need to consider the cumulative impact of stereotype exposure and to refine experimental designs to better capture the influence of stereotype perception on behaviour.

No mediations could be identified of Stereotype threat or User experience between Racist stereotype and Deepfake and Stop-and-search behaviour. More concretely the relevance of the potential mediators cannot be conclusively determined. The original theoretical framework remains to hold up as a possible framework for future research (Casad & Bryant, 2016).

The rejection of the main relationship and the insignificance of the proposed mediators suggest that further investigation is needed to better understand the dynamics between Racist stereotype, Stereotype threat, and behaviour.

Additional Findings

Unexpectedly, the results of the study revealed a substantial negative correlation between encountering a Deepfake version of the VR environment and choosing Person 1, who represented an ethnic minority. Participants showed a reduced inclination to select Person 1 in virtual Stop-and-search situations when they encountered the Deepfake portrayal. In contrast, there was a significant positive association between Deepfake and Person 2, indicating a tendency to avoid the ethnic

minority individual and instead select the next best person. The multinomial regression analysis also reflected this tendency, although with insignificant p-values.

Reflecting on the initial theoretical conflict between the notions of stereotypes leading to overpolicing and underpolicing, proposed by Trinkner and Goff 2020, respectively, neither theory explained the observed findings. The tendency observed in this study might point toward an underpolicing and avoidance approach by the police when interacting with ethnic minorities (McCarthy, 2021). However, this theory does not fully account for the subsequent increase in approaching other people instead of the minority individual. Considering new theoretical perspectives, stereotype reactance could explain why officers purposefully acted in opposition to the Racist stereotypes by not selecting the ethnic minority (Hakim et al., 2017). However, no differences were found between conditions in terms of exposure to the stereotype video, leaving the role of stereotypes in these findings unclear.

Another potential explanation for the findings could be the Hawthorne effect, whereby participants in a study may behave differently when being observed (McCambridge et al., 2014). As this study was conducted within police stations in close proximity to subordinates and colleagues, it is possible that test subjects wanted to adhere to social norms of not appearing discriminatory. Similarly, this tendency could also apply to actual on-duty Stop-and-search behaviour, where the social desirability of not being perceived as racist may lead to a disproportionate avoidance out of fear of being labelled as such (McCambridge et al., 2014).

However, it is important to note that these findings only indicate a potential tendency and require further investigation. The small sample size, particularly in some conditions with only 20 participants, as highlighted by the insignificant p-values, limits the generalizability of the results. Given the sensitive nature of the topic, practical implications for the future cannot be drawn solely from this study. Nevertheless, further investigation into the slight avoidance tendency would be valuable to understand whether it is a result of the experimental setup, such as the effects of being observed, or if it actually translates to real-life behaviour.

Considering previous research, it seems unlikely that this tendency observed in the study would directly apply to on-street behaviour, considering the well-documented disproportionate representation of ethnic minorities in police Stops (Leun & Woude, 2011). Nonetheless, the fear of being perceived as racist or discriminatory, whether leading to avoidance only in an observation setting or also in a real work setting, needs to be further addressed. Ultimately, this fear not only hinders the police officers themselves by impeding open discourse and potentially influencing research results, but it also leads to impaired behavior toward ethnic minorities, negatively impacting police-community relationships (Tracey, 2016).

Technological Mediation and User Experience

The explorative thematic analysis of User-experience highlighted the importance of the recurring topics contradicting and describing. On the side of contradicting this indicated a partial immersion given that participants reported feeling immersed simultaneously indicated being reminded of reality. On the other hand, the code describing highlighted that some participants experienced a level of immersion by describing the simulation as if it was real.

In regards to the code of contradiction, technological mediation theory posits that technology mediates our experiences and interactions with the world. In this context, the analysis highlights the contradictory nature of participants' perceptions. On one hand, they acknowledge the simulated nature of the technology, recognizing it as a constructed representation. On the other hand, their experience of the technology evokes a strong sense of realism, blurring the boundaries between the virtual and the real. These findings are in line with prior theory highlighting the impact of technology on perception suggesting that the technology bridges the gap between the user and the virtual environment, enabling a rather high but often interrupted degree of immersion (Feenberg, 2009).

The participants' descriptions of the environment as if it were real indicates that they may have suspended their disbelief and fully embraced the simulated experience. This would according to mediation theory indicate full immersion (Peter-Paul Verbeek & Crease, 2005).

Typically, when using technology as a medium, such as a laptop, to mediate between individuals and reality, people do not lose their sense of reality. However, with the emergence of new forms of mediation, such as virtual reality (VR), some individuals seem to disconnect from the real world and perceive VR as a fully detached simulation, separate from our present reality. This poses challenges when applying research findings from VR to the real world (Feenberg, 2009).

This disconnection is particularly evident in individuals displaying a pattern of contradiction, as they often refer to the VR environment as a simulation or a game, indicating a clear separation between the virtual world and reality. Conversely, individuals who describe the VR environment as if they were actually present demonstrate a high level of immersion and intuitively connect the virtual world to our real world. It is through this connection that behavioural tendencies observed in the virtual environment become more applicable to real-life contexts (Feenberg, 2009).

In practical terms, when working with VR or other forms of virtual representation aimed at simulating reality, such as deep fakes, it is crucial to ensure that users maintain a strong connection between the virtual world and our actual reality. This connection allows for full immersion and facilitates the application of findings and insights derived from virtual experiences to real-life situations. By acknowledging and preserving the fundamental laws and principles of the real world

within the virtual environment, researchers can ensure the transferability and relevance of their findings in practical contexts (Niculescu-Dincă, 2021).

Future Directions

This study underlines the need for more research on how stereotype perception affects Stop-and-search behavior in police officers. Future research might build upon this study's findings by using a more nuanced approach in grouping individuals into conditions according to their individual perception of the prevalence and strength of the Racist stereotypes they face. Participants who report a high perception of these stereotypes could replace those who were exposed to the Racist stereotype manipulation in previous experiments. By incorporating participants' subjective experiences, future research can better capture the influence of stereotype perception on behavior.

Furthermore, it would be worthwhile to revisit the mediator User-experience in this study using an improved experimental setup. The current study showed some suggestive relationships between variables, but a significant main relationship was not established. Future research should aim to replicate and strengthen these findings by refining the experimental design. This may involve controlling for confounding factors, increasing sample sizes, participant categorisation or employing more precise measurement techniques.

Further investigation into the potential new kind of mediation would also be an interesting avenue for future study. The categories of contradicting and describing in this study might be dummy coded in order to conduct statistical studies on the effects of these variables on responses or behavioral outcomes. Due to time constraints, this exceeded the scope of this study but would inform future directions of technological mediation theory.

Finally, future studies should take a comprehensive stance to explore how fear and social desirability and chronic stereotype affect policing behaviour specifically in the direction of avoidance. A thorough investigation of the interactions between fear, social desirability, chronic stereotype and police conduct would give a more complete knowledge of this complicated connection than the current study. This could entail using various research techniques, such as qualitative interviews or observational studies.

Limitations

While the current study provides valuable insights into the impact of Racist stereotypes on Dutch police officers' Stop-and-search behaviour in virtual reality (VR) scenarios as well as on the impact of the utilized technology, it is important to acknowledge several limitations that may affect the interpretation and generalizability of the findings.

The study utilized a relatively small sample size of 87 Dutch police officers, which may limit the statistical power and generalizability of the results. A larger sample would have provided a more robust basis for drawing conclusions about the effects of Racist stereotypes on police behaviour.

Given the sensitive nature of the study topic, participants may have been influenced by social desirability concerns, particularly in the presence of researchers within police stations. This bias may have affected their responses and behaviour during the VR experiment, potentially leading to the underreporting of discriminatory tendencies or the adoption of more socially acceptable behaviours.

The VR environment used in the study did not provide participants with the option of not making a selection during the Stop-and-search scenarios. This artificial constraint may have influenced participants' behaviour and decision-making, as they were compelled to choose one of the available options rather than having the freedom to refrain from making a selection. This limitation could have affected the ecological validity of the VR scenarios.

Due to technical constraints, the person representing an ethnic minority in the VR environment, particularly the person on the scooter, had to be positioned closer to the participant. This discrepancy in proximity may have inadvertently influenced participants' selection biases and behaviours. The altered position of the Deepfake character may have created an unintentional cue or bias that influenced participants' decisions, potentially compromising the validity of the findings.

These restrictions underline the need for caution when analyzing the study's findings. Larger sample sizes, ensuring scale reliability and validity, reducing social desirability bias or potentially making it the subject of investigation itself, offering more extensive options in VR environments, and overcoming technical hurdles should be the focus of future research to address these limitations and improve the fidelity and accuracy of Deepfake implementations.

Conclusion

Overall, this study contributes to the understanding of the complex dynamics between Racist stereotypes, police officers' behaviour, and the potential of VR and Deepfake technology as tools for research and intervention. By highlighting the need for nuanced investigations, consideration of User experience, and refinement of experimental designs, this study paves the way for future research to address the challenges and advance knowledge in this important area. Ultimately, the insights gained from this study can inform efforts to promote fair and unbiased policing practices, improve police-community relationships, and reduce the impact of stereotypes in law enforcement contexts.

References

- ACLU. (2019). *The Persistence Of Racial And Ethnic Profiling In The United States*. American Civil Liberties Union. <https://www.aclu.org/report/persistence-racial-and-ethnic-profiling-united-states>
- Barbot, B., & Kaufman, J. C. (2020). What makes immersive virtual reality the ultimate empathy machine? Discerning the underlying mechanisms of change. *Computers in Human Behavior*, *111*, 106431. <https://doi.org/10.1016/j.chb.2020.106431>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Carney, N. (2016). All lives matter, but so does race: Black lives matter and the evolving role of social media. *Humanity & Society*, *40*(2), 180–199. <https://doi.org/10.1177/0160597616643868>
- Casad, B. J., & Bryant, W. J. (2016). Addressing Stereotype Threat is Critical to Diversity and Inclusion in Organizational Psychology. *Frontiers in Psychology*, *7*(8). <https://doi.org/10.3389/fpsyg.2016.00008>
- Cokelaere , H. (2023, February 14). *Dutch police are guilty of racial profiling, court rules*. POLITICO. <https://www.politico.eu/article/dutch-police-found-guilty-racial-profiling-royal-netherlands-marechaussee-hague-ngo-amnesty-international/>
- Cornet, L. J. M., & Van Gelder, J.-L. (2020). Virtual reality: a use case for criminal justice practice. *Psychology, Crime & Law*, *26*(7), 631–647. <https://doi.org/10.1080/1068316x.2019.1708357>
- Council of Europe. (2019a). *Council of Europe - Highlights 2019*. Council of Europe Publishing. <https://edoc.coe.int/en/annual-activity-report/8197-council-of-europe-highlights-2019.html>
- Council of Europe. (2019b, May 7). *Ethnic profiling: a persisting practice in Europe*. Commissioner for Human Rights; Council of Europe. <https://www.coe.int/en/web/commissioner/-/ethnic-profiling-a-persisting-practice-in-europe>
- de Vrijs, P., Bas Böing, Mulder, E., & Jean-Louis van Gelder. (2023). *Sugarcoating a Bitter Pill - VR Against Police Ethnic Profiling*. 22–35. https://doi.org/10.1007/978-3-031-30933-5_2
- Deuchar, R., Miller, J., & Densley, J. (2019). The Lived Experience of Stop and Search in Scotland: There Are Two Sides to Every Story. *Police Quarterly*, *22*(4), 416–451. <https://doi.org/10.1177/1098611119849646>
- European Commission against Racism and Intolerance (ECRI) - Homepage*. (2020). European Commission against Racism and Intolerance (ECRI). <https://www.coe.int/en/web/european-commission-against-racism-and-intolerance>

- Feenberg, A. (2009). Peter-Paul Verbeek: Review of What Things Do. *Human Studies*, 32(2), 225–228. <https://doi.org/10.1007/s10746-009-9115-3>
- Fox, J., Arena, D., & Bailenson, J. N. (2009). Virtual Reality. *Journal of Media Psychology*, 21(3), 95–113. <https://doi.org/10.1027/1864-1105.21.3.95>
- Gauthier, J. F., & Graziano, L. M. (2018). News media consumption and attitudes about police: in search of theoretical orientation and advancement. *Journal of Crime and Justice*, 41(5), 504–520. <https://doi.org/10.1080/0735648x.2018.1472625>
- Hakim, C., Kurman, J., & Eshel, Y. (2017). Stereotype Threat and Stereotype Reactance: The Effect of Direct and Indirect Stereotype Manipulations on Performance of Palestinian Citizens of Israel on Achievement Tests. *Journal of Cross-Cultural Psychology*, 48(5), 667–681. <https://doi.org/10.1177/0022022117698040>
- Home Office. (2022, October 27). *Police powers and procedures: Stop and search and arrests, England and Wales, year ending 31 March 2022*. GOV.UK. <https://www.gov.uk/government/statistics/police-powers-and-procedures-stop-and-search-and-arrests-england-and-wales-year-ending-31-march-2022/police-powers-and-procedures-stop-and-search-and-arrests-england-and-wales-year-ending-31-march-2022>
- Johnson, L. M., Devereux, P. G., & Wagner, K. D. (2022). The group-based law enforcement mistrust scale: psychometric properties of an adapted scale and implications for public health and harm reduction research. *Harm Reduction Journal*, 19(1). <https://doi.org/10.1186/s12954-022-00635-3>
- Junger-Tas, J. (1997). Ethnic Minorities and Criminal Justice in the Netherlands. *Crime and Justice*, 21, 257–310. <https://www.jstor.org/stable/1147633>
- Kietzmann, J., Lee, L. W., McCarthy, I. P., & Kietzmann, T. C. (2019). Deepfakes: Trick or treat? *Business Horizons*, 63(2), 135–146. <https://doi.org/10.1016/j.bushor.2019.11.006>
- Kleygrewe, L., Hutter, R. I. V., Koedijk, M., & Oudejans, R. R. D. (2023). Virtual reality training for police officers: a comparison of training responses in VR and real-life training. *Police Practice and Research*, 1–20. <https://doi.org/10.1080/15614263.2023.2176307>
- Kyrre, J., & Crease, R. P. (2015). *Technoscience and Postphenomenology*. Lexington Books.
- Leun, J. P. van der, & Woude, M. A. H. van der. (2011). Ethnic profiling in the Netherlands? A reflection on expanding preventive powers, ethnic profiling and a changing social and political context. *Policing and Society*, 21(4), 444–455. <https://doi.org/10.1080/10439463.2011.610194>
- McCambridge, J., Witton, J., & Elbourne, D. R. (2014). Systematic review of the hawthorne effect: New concepts are needed to study research participation effects. *Journal of Clinical Epidemiology*, 67(3), 267–277. <https://doi.org/10.1016/j.jclinepi.2013.08.015>

- Mccarthy, M., Trinkner, R., & Atiba Goff, P. (2021). The Threat of Appearing Racist: Stereotype Threat and Support for Coercion Among Australian Police Officers. *Criminal Justice and Behavior*, 48(6), 009385482199351. <https://doi.org/10.1177/0093854821993513>
- Niculescu-Dincă, V. (2021). Theorizing Technologically Mediated Policing in Smart Cities: An Ethnographic Approach to Sensing Infrastructures in Security Practices. *Philosophy of Engineering and Technology*, 75–100. https://doi.org/10.1007/978-3-030-52313-8_5
- Nieuwenhuis, M. (2015). *The Netherlands' disgrace: racism and police brutality*. OpenDemocracy. <https://www.opendemocracy.net/en/can-europe-make-it/netherlands-disgrace-racism-and-police-brutality/>
- Nieuwenhuis, M. (2015). *The Netherlands' disgrace: racism and police brutality*. OpenDemocracy. <https://www.opendemocracy.net/en/can-europe-make-it/netherlands-disgrace-racism-and-police-brutality/>
- Open Society foundations. (2013). *Ethnic Profiling: What It Is and Why It Must End*. Opensocietyfoundations.org. <https://www.opensocietyfoundations.org/explainers/ethnic-profiling-what-it-and-why-it-must-end>
- Pennington, C. R., Heim, D., Levy, A. R., & Larkin, D. T. (2016). Twenty Years of Stereotype Threat Research: A Review of Psychological Mediators. *PLOS ONE*, 11(1), e0146487. <https://doi.org/10.1371/journal.pone.0146487>
- Peter-Paul Verbeek, & Crease, R. P. (2005). *What things do : philosophical reflections on technology, agency, and design*. The Pennsylvania State University Press, Cop.
- Pyle, O. (2022, June 5). *Fast decision-making in policing and perception of risk*. College of Policing. <https://www.college.police.uk/article/fast-decision-making-policing-and-perception-risk>
- Spencer, S. J., Logel, C., & Davies, P. G. (2016). Stereotype Threat. *Annual Review of Psychology*, 67(1), 415–437. <https://doi.org/10.1146/annurev-psych-073115-103235>
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69(5), 797–811. <https://doi.org/10.1037/0022-3514.69.5.797>
- Tankebe, J. (2021). Moral Contexts of Procedural (In)Justice Effects on Public Cooperation with Police: A Vignette Experimental Study. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3954046>
- Tracey, T. J. G. (2016). A note on socially desirable responding. *Journal of Counseling Psychology*, 63(2), 224–232. <https://doi.org/10.1037/cou0000135>

Trinkner, R., Kerrison, E. M., & Goff, P. A. (2019). The force of fear: Police stereotype threat, self-legitimacy, and support for excessive force. *Law and Human Behavior, 43*(5), 421–435. <https://doi.org/10.1037/lhb0000339>

Woodcock, A., Hernandez, P. R., Estrada, M., & Schultz, P. W. (2012). The consequences of chronic stereotype threat: Domain disidentification and abandonment. *Journal of Personality and Social Psychology, 103*(4), 635–646. <https://doi.org/10.1037/a0029120>

Appendix A

LinkedIn Post



Bas Böing · 1.



Program Lead, PhD researcher, chair
8 Monate · 🌐

Together with our partners Universiteit Twente, Politieacademie, and Scopic_Labs, the Dutch Police Politie Nederland recently started a pilot-project with deepfaking. Using this cutting-edge technology allows us to determine how different manipulations (such as skin colour) impact police officers decision-making. This is important for awareness, policy and training.

For photos and more information:

#deepfake #deescalation #policetraining
#politievooriedereen #police #racialequity
#racialjustice #iacp2022 #iacp

Maike Gieling Peter de Vries Justin Karten Erik Jan Bijvank.



Appendix B
Final Questionnaire

Number	English	Dutch
Q1	Now alert one of the researchers. The latter will check the appropriate condition for you below, and then show you a video.	Waarschuw nu één van de onderzoekers. Deze zal voor jou de juiste conditie hieronder aanvinken, en je daarna een video tonen.
Q2	Welcome	Welkom
Q3	Age	Leeftijd
Q4	Gender	Geslacht
Q5	How long (approximately) have you worked in the Police Department?	Hoelang (ongeveer) werkt u al bij de Politie?
Q6	The researcher is now going to show you a video.	De onderzoeker gaat u nu een video laten zien.
Q7	Video	Video
Q8	VR	VR
Q9	What code did you see at the end of the simulation?	Welke code kreeg je te zien aan het einde van de simulatie
Q10	It is possible that you addressed someone in the simulation. If so, what do you think was the reason for this? If you did not address anyone, fill in "N/A."	Mogelijk heb je in de simulatie iemand aangesproken. Als dat het geval was, wat was volgens jou hiervoor de reden? Indien je niemand hebt aangesproken, vul dat in 'N.V.T.'
Q11	Also, would you have asked this person for their ID information? If you did not ask anyone, fill in "N/A."	Zou je deze persoon ook om zijn ID-gegevens hebben gevraagd? Indien je niemand hebt aangesproken, vul dat in 'N.V.T.'
Q12	If you did not address anyone, what do you think was the reason for this? If you did address someone, fill in "N/A."	Indien je niemand hebt aangesproken, wat was volgens jou hiervoor de reden? Indien je wel iemand hebt aangesproken, vul dat in 'N.V.T.'

	User experience	
Q13	During the simulation, I often thought I was there.	Ik dacht tijdens de simulatie vaak dat ik echt op de locatie was.
Q14	During the simulation, the situation felt realistic.	Tijdens de simulatie voelde de situatie realistisch aan.
Q15	During the simulation, interaction with the other people felt realistic.	Tijdens de simulatie voelde de interactie met andere mensen erg realistisch.
Q16	During the simulation, I had the feeling that my choices influenced the course of the story.	Tijdens de simulatie had ik het gevoel dat mijn keuzes invloed hadden op het verloop van het verhaal.
Q17	During the simulation, I felt involved in the story.	Tijdens de simulatie voelde ik mij erg betrokken bij het verhaal.
Q18	I had a lot of fun during the simulation.	Ik had veel plezier tijdens de simulatie.
Q19	I felt immersed in the VR.	Ik voelde me ondergedompeld in de VR.
Q20	How do you feel about the VR environment? Explain the extent to which you felt it was realistic and reflected your actions in real life (please explain why).	Wat vind je van de VR-omgeving? Leg uit in hoeverre je het gevoel had dat het realistisch was en je acties in het echte leven weergaf (gelieve uit te leggen waarom).
Q21	Transition	Transition
	Self-legitimacy	
Q22	I am confident that I, as a police officer, have enough authority to do my job well.	Ik heb er vertrouwen in dat ik als politieagent voldoende bevoegdheden heb om mijn werk goed te doen.
Q23	I believe, that I, as a police officer, occupy a position of special importance society.	Ik geloof dat ik, als politieagent, een positie bekleed die van bijzonder belang is in de samenleving.
Q24	I am confident that I, in the role of a police officer, am effective in contributing to crime prevention and community safety.	Ik ben ervan overtuigd dat ik, in de rol van politiemedewerker, effectief kan bijdragen aan misdaadpreventie en veiligheid in de gemeenschap.
	Stereotype threat	
Q25	I worry that people may think of me as racist because I am a police officer.	Ik ben bezorgd dat mensen mij zouden kunnen zien als racist enkel omdat ik politiemedewerker ben.

Q26	I worry that people I deal with on the job might misinterpret something I say as racist.	Ik ben bezorgd dat burgers mijn woorden soms misinterpreteren als racistisch.
Q27	I worry that being a police officer makes it harder for me to be friendly with people from racial or ethnic minority groups.	Ik ben bezorgd dat mijn werk als agent het moeilijker maakt om vriendelijk te zijn tegen mensen met een andere etnische achtergrond.
Q28	I worry that being a police officer influences what people who are racial or ethnic minority group members think of me.	Ik ben bezorgd dat mijn werk als agent invloed heeft op hoe mensen met een andere etnische achtergrond naar mij kijken.
Q29	worry about whether I come across as racist when I deal with people from racial or ethnic minority groups.	Ik ben bezorgd dat mensen met een andere etnische achtergrond mij als racistisch zouden kunnen zien.
	Workplace racial anxiety	
Q30	I fear that I perform poorly in interracial interactions.	Ik denk dat ik matig presteer in interacties met mensen met een andere etnische achtergrond.
Q31	I worry that I will not be able to successfully avoid appearing as racist.	Ik ben bezorgd dat het mij niet lukt om niet racistisch over te komen.
Q32	I feel anxious in interracial work-situations.	Ik voel mij opgelaten in werksituaties met mensen met een andere etnische achtergrond.
	Force support	
Q33	Police officers should be free to exert more physical force when needed.	Politied medewerkers zouden vrijer gelaten moeten worden gelaten om geweld te gebruiken wanneer nodig.
Q34	Members of the public will have more confidence in police if officers use a tough, physical approach on the street.	Burgers hebben meer vertrouwen in de politie als agenten op straat een harde, fysieke aanpak hanteren.
Q35	Sometimes forceful police actions are very educational for members of the public.	Soms is krachtig politieoptreden een leerzame ervaring voor het publiek.
Q36	If officers don't show that they are physically tough, they will be seen as weak.	Als agenten niet laten zien dat ze fysiek sterk zijn, worden ze als zwak beoordeeld.

	Feelings of stigma	
Q37	I, as a police officer, feel treated unfairly by the publicity regarding structural racism in the police.	Als politieagent voel ik me oneerlijk behandeld door de publiciteit over structureel racisme bij de politie.
Q38	When people think I am racist, it does not bother me. (r)	Als mensen denken dat ik racistisch ben, stoort me dat niet.
Q39	I think it is unfair that people often expect police officers to be racist.	Ik vind het oneerlijk als mensen denken dat politieagenten racistisch zijn.
Q40	Would you tell us a little more about whether, and if so, in what ways you, as a police officer, feel emotionally affected by the public debate about structural racism in policing?	Wil je ons iets meer vertellen of, en zo ja, op welke manier u zich als politieagent emotioneel geraakt voelt door het publieke debat over structureel racisme bij de politie?
Q41	Within the Police for All program, training is offered, which provides tools on how to deal with racist stereotypes. To what extent are you willing to participate in this type of activity?	Binnen het programma Politie voor Iedereen worden trainingen aangeboden, die handvatten bieden hoe je om kunt gaan met racistische stereotypen. In hoeverre bent u bereid om aan dit soort activiteiten deel te nemen?
Q42	Post-Consent	Post-Consent
Q43	Bye	Bye