Citizen's perception of Augmented Reality with regard to the impact on trust in the police

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Abstract

Objective: This study explores how citizens perceive augmented reality (AR) used by police officers. Citizen's perception is important as they constitute a crucial factor of effective policing. Specifically, it is investigated how trust in the police changes through technology as trust has been shown to increase the willingness for cooperation or to obey the law. Additionally, to unravel this relationship, perceived effectiveness, fear of crime, and the type of information displayed by technology serve as moderators.
Method: Several questionnaires were used to measure the variables. The participants (N=141) were randomly assigned to one condition in a 3 (AR, mobile phone, no technology) x 3 (navigation, notification, facial recognition) between-subject design. Per condition, one video of a police officer showing technology and type of information was presented, serving as manipulation.
Results: No significant differences between the three technology groups and their impact on trust could be found. Also, the role of the three moderators could not be supported.
Conclusion: This study is the first one known investigating citizen's perception of AR. One possible implication could be that AR is not evaluated as something negative. Also, trust of citizens may be consolidated and independent on the type of technology used. However, further research is needed to gain more knowledge about the relationship, with a focus rather on how technology is used than which technology is used.

Introduction

Augmented reality glasses (AR) gain in importance for a diverse field of application. The implementation of AR glasses in police work is a recently discussed topic by the Dutch police academy. However, there is still a need for research to be able to ensure efficient usage and implementation. From the perspective of technological development, AR is developed far enough to be implemented. Also, regarding the perspective of the police officers, it has already been shown that their perception could be improved by using AR, e.g. due to increased situational awareness (Cowper & Buerger, 2003). However, since public support is needed to decrease possible police-citizens conflicts, reduce crime, and ensure a better flow of information, citizens play a key role in effective policing (Segrave & Ratcliffe, 2004).

Accordingly, the question how the usage of this new technology has an impact on the way citizens perceive the police work needs to be clarified. Several studies indicate that by shaping trust of citizens in the police, the willingness to cooperate with the police and the willingness to obey law increases (Reisig, Bratton, & Gertz, 2007; Stoutland, 2001; Tyler, 2005; Tyler & Fagan, 2008). Therefore, it is especially important to examine how the trust level of citizens in the police changes by the use of AR glasses as trust in the police can be seen as a basis for further relations.

In order to reveal how the influence of AR on trust will look, this study is going to

compare citizen's perception of AR to mobile phones and traditional policing which refers to no usage of technology at all. It is examined how these different types of technology impact the level of trust of citizens. Moreover, this study will unravel this relationship by determining how the relationship between AR and trust is influenced by the level of perceived effectiveness, fear of crime and the type of information displayed by the technology.

Augmented reality in policing

Augmented reality can be defined "as a real-time direct or indirect view of a physical real-world environment that has been enhanced/*augmented* by adding virtual computer-generated information to it" (Carmigniani & Furht, 2011, p.3). In contrast to virtual reality (VR), AR uses the real environment to add information unto, instead of creating a completely new virtual space (Carmigniani & Furht, 2011). Currently, the use of the technology is already well-established in fields such as entertainment, military, or medicine, but also newer fields such as education, marketing, and tourism exist that work on the implementation of AR (Mekni, & Lemieux, 2014).

Furthermore, policing represents a recently established field of application. In policing, possible examples of the application of AR-glasses by patrol officers may be the implementation of real-time language translation; facial, voice-print or other biometric recognition data of criminals, or scalable 3d-maps of e.g. buildings to improve the situational awareness of the officers (Cowper & Buerger, 2003). In the current study, three broad categories of possible future implementation will be investigated, namely navigation, notification, and facial recognition.

Until now, research particularly focused on the benefits of AR for police officers. From a police officer's perspective, the generally increased perception of reality through AR points out one of the most important benefits (Carmigniani & Furht, 2011; Mekni & Lemieux, 2014). To underline how useful the implementation of AR in the policing context can be, two arguments should be mentioned. Firstly, according to a study of the FBI conducted by Cowper and Buerger (2003), the increased perception can be seen as an important distinctive feature of AR in the field of policing. Situational awareness is relevant, especially for patrol officers, and by using AR one person has the same potential situational awareness as three unequipped individuals (Cowper & Buerger, 2003). Secondly, in a recent article Schakel, Rienks, and Ruissen (2013) point out that by designing and using augmented reality, "information may become as intertwined with action as it can ever get" (p.171). This means that all information police officers receive are related to a specific context at a given time.

Besides the perception of the officers, another factor relevant for efficient police work is the perception of citizens. Police is a public service organization, often working in close collaboration with citizens and communities. Only by ensuring public support, the police can work most efficiently and effectively (Carter & Carter, 2009; Schafer, Huebner, & Bynum, 2003). Consequently, there is a need to investigate how each implementation of new technology has an influence on citizen's perception of the police.

In the following, the variable trust in relation to AR will be analysed in detail. Furthermore, perceived effectiveness and fear of crime and possible relations to trust and technology are analysed. Both variables have been shown to be an important predictor for the future support of different kind of technologies in policing (Heen, Lieberman, & Miethe, 2018; Tuttle, Heen, Sakiyama, Miethe, & Liebermann, 2016), which underlines the relevance of studying these two variables. Finally, different types of information shown by technology with a possible link to trust are discussed.

Trust

Before being able to analyse the role of trust, a clear definition of the concept needs to be established. Trust in the police entails the police being viewed as honest and competent fulfilling all their responsibilities. Besides, it encompasses a respectful treatment of citizens and good intentions of the police officers to fulfil all needs of the public (Schreurs, 2019; Stoutland, 2001; Tyler, 2005).

As previously mentioned, trust is generally a critical factor to improve the citizen-police relationship and consequently increases the willingness of citizens to cooperate and to obey the law. Besides, it is noteworthy that trust is an important predictor for the overall support of body-worn cameras (BWCs) as a new kind of technology in policing (Sousa et al, 2018). This underlines the importance of studying trust before implementing AR, since a higher trust level then may also increase the support of AR by the public.

In order to, explore the relationship between AR and trust, the effects of already implemented technologies in policing, especially body-worn cameras (Sousa, Miethe, & Sakiyama, 2018), or drones (Heen, Lieberman, & Miethe, 2018) are translatable to the effects expected to be found for AR. The former two technologies belong to the category of technologies for surveillance and crime detection (Willis, 2019), a category to which AR can also be classified. Moreover, in this study mobile phones serve as a comparison group for AR. Since, mobile phones are rather categorized as communication technology than as a technology for surveillance and crime detection (Willis, 2019), it is possible to translate the

findings for BWCs and drones to how AR will be perceived in contrast to mobile phones. In line with this, BWCs and drones are also translatable to the perception of AR in comparison the third group of traditional policing style using no technology at all, as this group highlights a completely different style of policing. Therefore, this research paper uses studies about citizen's perception of BWCs and drones, to get an impression for how AR in comparison to mobile phones and no technology may be perceived by citizens.

In the last years, body-worn cameras (BWCs) have been implemented in several tasks of police officers and are claimed to be an important tool for achieving the trust of citizens (President's Task Force, 2015). A study by Sousa et al. (2018) analysed how the implementation of BWCs as a new police technology influences the trust perception of citizens. They showed that around two-thirds of the citizens perceive BWCs as a tool to increase trust. However, Sousa et al. (2018) noted that the way how citizens evaluated BWCs in terms of trust level showed the widest discrepancies of all variables measured in this study. As a reason for this, it was mentioned that through the recording feature of BWCs, a video of the police showing an officer in a controversial situation may lead to lower levels of trust. However, overall, most citizens perceived the technology as a tool to increase trust (Sousa et al., 2018). This positive effect of BWCs on trust could also be supported by another study by Demir, Apel, Braga, Brunson and Ariel (2020) which investigated the usage of BWCs in traffic stop situations. They pointed out that drivers stopped by police officers with BWCs evaluated trust in the police significantly higher than drivers of the control group stopped by officers without BWCs.

To sum up, the implementation of new technology can help to build the trust of citizens (President's Task Force, 2015). Therefore, in the current study, it is assumed that AR glasses will have a positive influence on the level of trust of citizens compared to mobile phones or policing without technology. Thus, it is hypothesized that:

> *H1: The usage of augmented reality glasses by the police will lead to a higher level of trust perceptions of citizens in the police in comparison to the other two conditions, namely policing with mobile phones or without any technology.*

Perceived effectiveness

Along with the previous hypothesis about the influence of AR on the level of trust, the possible role of perceived police effectiveness needs to be examined. Perceived police effectiveness is related to the perception of citizens of how quickly the police helps, how

successful they are, how they solve neighbourhood problems, and to what extent they are able to control crime (Heen et al., 2018; Sunshine & Tyler, 2003; Tyler, 2005). Generally, the higher the perceived effectiveness, the more positive are also the attitudes people have towards policing (Heen et al., 2018; Sunshine & Tyler, 2003).

The link between trust and perceived effectiveness is already established. A study by Kääriäinen and Sirén (2011) aimed to figure out how generalized trust in the police is built and which effect the trust of citizens has on police work. The authors describe a link between trust and police effectiveness in such a way that if citizens perceive the police to work effectively, they will trust the police. This means that trust is dependent on how citizens observe police work, which in turn is what perceived effectiveness entails (Kääriäinen & Sirén, 2011). Along with this, Heen et al. (2018) studied how citizens perceive the implementation of drones and how effectiveness and police legitimacy perceptions influence the support of the technology. They showed that the trust people have in police work is further encouraged by perceived effectiveness. The same authors infer that trust is built through actions that are perceived as effective by the public and serve the public interest.

Moreover, perceived effectiveness has been shown to moderate the relationship between drones and the public support of the technology in such a way that higher levels of support were found for people who rated the effectiveness of the police as high (Heen et al., 2018). As previously mentioned, drones, as well as AR, can be classified as crime and surveillance technology and therefore serve as an indicator for citizen's perception.

After all, it is assumed that higher perceived effectiveness will strengthen the trust of citizens. Considering the previously established link between AR and trust, in the current study, it will be assumed that the level of perceived effectiveness will strengthen the relationship between the type of technology used and trust perception of the citizens. Consequently, it is hypothesized that:

> *H2: Perceived effectiveness moderates the relationship between the type of technology used by the police (no technology, mobile phones, AR glasses) and trust perceptions, such that this relationship is stronger when perceived effectiveness of the police is high than when it is low.*

Fear of Crime

Another variable that plays a role is the fear of crime. In this paper, fear of crime will be defined as a variable not only encompassing the fear of victimization but also the emotional

component of worrying about possible crimes (Renauer, 2007). Since fear of crime seems to influence justice attitude, it represents a relevant variable to study. Lower levels of fear of crime have been found to positively influence the attitudes of people towards the justice system (Singer et al., 2019).

For the relationship between fear of crime and trust, a study by Hawdon, Ryan, and Griffin (2003) found an inverse bivariate correlation between fear of crime and the question whether people trust the police. This means, that lower levels of fear of crime were correlated with higher trust levels, and vice versa. This is in line with several other studies which also identified that lower feelings of fear of crimes are linked to higher feelings of trust as well as higher satisfaction and perceived effectiveness of the police (Kääriäinen, 2008; Priest & Carter, 1999; Weitzer & Tuch, 2005). Taken together, the studies show consistently an inverse relationship between fear of crime and trust.

Furthermore, to take a closer look at how the two variables influence each other, a research paper by Singer et al. (2019) is noteworthy which examined which effect fear of crime and victimization have on trust and fairness. They compared four countries, namely the United States, Mexico, Argentina, and Brazil and found that fear of crime had a consistently significant negative effect on the level of trust in the police. Although the strength of the effect differed between the countries, the negative influence could be confirmed.

Besides the relation between trust and fear of crime, one also needs to consider the type of technology used. As stated previously, findings for BWCs are translatable to how citizens perceive AR. In line with this, one study by Crow, Snyder, Chrichlow, and Smykla (2017) who revealed that higher levels of fear of crime lead to significant lower benefit perception in BWCs might give an indication. They discovered that lower levels of trust are related to less support for BWCs which in turn is influenced by crime concerns. This result suggests that fear of crime influences the link between the type of technology used and the level of trust. Thus, in the current study, it is assumed that fear of crime will moderate the previously described relationship between the type of technology used by the police and trust perceptions. Therefore, it is hypothesized that:

> *H3: Fear of crime moderates the relationship between the type of technology used by the police (no technology, mobile phones, AR glasses) and trust perceptions, such that this relationship is stronger when fear of crime is low than when it is high.*

Type of information

After careful consideration of how AR may influence the level of trust people have in the police and which variables may play an additional role for this relationship, it is also important to take into account how different functions of technology may influence the level of trust. Generally, the context of every police activity, regardless of the usage of technology, gets evaluated on different levels by the public. Several studies distinguish between reactive and proactive police operations. Reactive ones refer to a situation where police are providing a service and are acting on-call. This is perceived by citizens as a more traditional form of policing. Contrary, in proactive situations, the police are rather trying to prevent criminality actively (Heen et al., 2018; Sakiyama, Miethe, Lieberman, Heen, & Tuttle, 2016). Overall, reactive operations are evaluated more positively and gain greater support of the public (Sakiyama et al., 2016).

As previously mentioned, drones and AR can be classified as surveillance and crime detection technologies, which makes findings for drones translatable to AR. By considering citizen's reaction to drones, it gets clear why the implementation of AR also requires a differentiation in police contexts. In a study by Heen et al. (2018), the support of the public for drones is highest for reactive policing application. Examples for such situations are investigations to protect someone's life by searching a missing person (Heen et al., 2018). Conversely, the implementation of drones in proactive situations, such as monitoring public spaces, has only half the support of the public compared to reactive ones (Heen et al., 2018). An explanation may be the rather nebulous intent of proactive actions, the feelings of surveillance-like monitoring as well as the rather high level of ambiguity (Heen et al., 2018; Sakiyama et al., 2016). In other words, the clearer the purpose of an operation is and the more it is in direct service for citizens, the higher is the overall support.

These results are also in line with Miethe, Lieberman, Sakiyama, & Troshynski (2014) who reported almost universal opposition of citizens when drones will be used for monitoring issues. Taken all results together, it gets clear that the type of information displayed by the technology moderates the relation between technology and support in such a way that reactive policing gains greater support for a technology used. Since the support for a certain technology and the level of trust strongly correlate with each other (Sousa et al., 2018), this leads to the assumption that the type of information will also moderate the relation between type of technology and trust.

More precisely, in the context of the current study, this means that the different type of

information, namely navigation, notification, and facial recognition, will lead to different levels of trust. Each category focuses on one specific type of information from rather general data like navigation, to more citizen-specific information like notification about emergencies up to sensitive data of using facial recognition. This classification is supported by a study by Van Zoonen (2016) investigating how smart city technologies influence the privacy concerns among citizens. According to the author, data provided by technology is on the one hand evaluated by a dimension representing how personal the data is and on the other hand by the purpose for which the data is used. For the purpose, a continuum between data for service purpose and data for surveillance purpose is proposed (Van Zoonen, 2016). For the three categories in the current study, this means that facial recognition raises more controversy compared to notification, and notification more controversy compared to navigation.

Based on the schema of reactive and proactive situations, as well as based on the established classification, it is assumed that navigation and notification will lead to a higher level of trust. The reason is that both can be classified as reactive operations and they seem to raise less controversy due to being not as personal and rather represent a service for citizens. Conversely, it is expected that facial recognition will result in lower levels of trust since it raises more controversy due to being a rather personal data and used more for surveillance purpose. Besides, facial recognition is also categorized as proactive policing.

Additionally, it is expected that within the facial recognition condition, the level of trust will be lower in the AR condition than in the other two conditions. Accordingly, it is hypothesized that:

> *H4: The type of information received (navigation, notification, facial recognition) moderates the relationship between the type of technology used by the police (no technology, mobile phones, AR glasses) and trust perception, such that this relationship is weaker for the usage of AR glasses for facial recognition than for notification and navigation.*

Methods

Design

For the study, a 3x3 between-subject design was employed. The first three levels of the independent variable described the kind of technology used including no technology, mobile phones, and augmented reality. The second three levels described the type of information, namely navigation, notification, and facial recognition. Along with those nine conditions,

'trust' served as a dependent variable. The variables 'perceived effectiveness', 'fear of crime', and 'type of information' served as moderators. Noteworthy, as the study is about the Dutch police, the manipulation shown to the participants as well as the questionnaire were in Dutch.

Participants

For this cross-sectional survey, a convenience sample of 197 participants out of the general public was used. Out of this sample, 141 have been included for the analysis. The other participants (N=56) were excluded as they did not consent with participating (N=5), stopped early in the questionnaire, so did not answer questions relevant for this research paper (N=48), or because they just clicked through the questions and answered all the same (N=3). Additionally, there were a few participants (N=11) who took longer than 30 minutes to fill out the questionnaire. Those were inspected further as this seems problematic for the working mechanism of the manipulation due to pausing the questionnaire half-way and finishing it later. However, all total scores were in a reasonable range around the mean, so the answers were included anyway.

The only requirement to take part in the survey was to be able to understand Dutch. Of the 141 participants finishing the survey, 34% were male and 65% female. The age span was between 14 and 78 with a mean age of 33 (*SD*=16.88). As expected, due to aiming at students first, approximately half of the participants (N=73) were 25 or younger. However, this rather younger sample is not problematic for analysing the data. Furthermore, the distribution of nationality was 90% Dutch, 8% German, and 2% of a different origin. In addition to this, about the current place of residence, approximately half indicated to live in a rural area (47%) and the other half to live in a city (51%).

Measures

Trust

For measuring trust, a scale designed by Schreurs (2019) has been used. This scale was a combined one with items of Stoutland (2001) and Bradford, Sargeant, Murphy, and Jackson (2017). In total, nine items (see Appendix A) have been used which were introduced by a sentence referring to the video of the police officer the participants have seen. Specifically, participants were asked to rate to which extent they agreed with statements such as: 'The police treat everyone fairly regardless of who they are' and 'The police understand the issues that affect this community'. Responses were assessed by using a 5-point Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree).

For the analysis, one trust score has been created by averaging the scores on these nine items. A high score on this scale meant that the participant showed more trust in the police.

Perceived effectiveness

Perceived effectiveness was measured by three items (see Appendix B) based on a study of Heen et al. (2018). In order to make this measure more in line with the other ones used in the questionnaire, the original scale formulated in questions and ratings from 'poor' to 'good' has been changed into a statement form. Specifically, participants were asked to rate to which extent they agreed with the following statements: 'The police is doing a good job in dealing with the problems that really concern people in my neighbourhood', 'The police is doing a good job in my neighbourhood in working together with residents to solve local problems' and 'The police is doing a good job to prevent crime in my neighbourhood'. Responses were assessed by using a 5-point Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree).

For the analysis, a perceived effectiveness score has been created by averaging the scores on these three items. A high score on this scale meant that the participant perceived the police as working more effectively.

Fear of crime

To assess the variable 'fear of crime', a scale by Renauer (2007) was used who combined his scale based on two scales about 'fear of violent crime' and 'fear of property crime' developed by Zhao, Gibson, Lovrich, and Gaffney (2002). It consisted of seven items (see Appendix C) whereby one item has been changed from 'getting beaten up, shot, or knifed' to only 'getting beaten up'. The basis for this decision was that the scale by Renauer (2007) was used in the American context and 'getting shot or knifed' did not fit into the Dutch context. Specifically, participants needed to indicate the extent to which they worry about the described scenarios such as: 'getting murdered', 'getting burglarized while no one is home', and 'getting sexually assaulted'. The responses were assessed on a 5-point Likert-scale from 1 (never) to 5 (very frequently).

For the analysis, one fear of crime total score has been created by averaging the scores on these seven items. A higher score meant that the participant had a higher level of fear of crime.

Procedure

The questionnaire has been created by using the software Qualtrics. One platform for publication was the Sona system used by all BMS (Behavioural, Management and Social sciences) students of the University of Twente. Everyone recruited via the system, received 0.25 Sona points for their participation. The second approach to recruit participants was to send the link around to the general public through different social media platforms. Before starting with data collection, the study has been approved by the BMS ethics committee of the University of Twente.

When taking part in the survey, participants needed first to sign an informed consent to be able to proceed further with the study. Every person asked to participate, did this voluntarily and was able to withdraw at any moment. In the informed consent, a cover story has been created which told the participants that the purpose of the study was to investigate citizens perceptions of and attitudes towards the police. At the end of the survey, the exact purpose of the study was clarified, and the details of the researchers have been provided in case of further clarification needed for the participants.

The survey itself consisted of five demographic questions, nine standardized questionnaires, and a video of a Dutch police officer serving as manipulation. In total, there were nine videos presented and through even randomization, each participant has been assigned to one specific video representing one condition. The videos were uploaded on the platform YouTube and inserted into the questionnaire. In the videos, a Dutch police officer was filmed, who first introduced himself and explained generally what his job entails and that providing security for citizens is the goal. Then, he started to explain how he does his work by telling which device he is using and what type of information he can gather with it. Both components in combination served as the manipulation for the participants. The police officer explained everything unobtrusively, so without mentioning directly which type of information he gathered but rather by describing how he came to the information.

For the traditional condition, the police officer described that he grew up in this city and that he, therefore, knows everything in the city including every street to find his way, the criminal hotspots, and the faces of criminals. For the mobile phone condition, the police officer showed his phone in his hand and described how he uses it for the three different types of information. For navigation, he described that his phone lets him know where he needs to go to. For notification, he explained that he uses his phone to get notifications of where the criminal activities take place and for facial recognition, he described to execute a facial

recognition scan after inserting a photo of a criminal to know as fast as possible who this person is. Finally, for the last technical condition of augmented reality, the police officer touched his AR glasses and described what he is able to see through the glasses. For navigation, he described that his AR glasses lets him know where he needs to go to and that for notification, he receives notifications on his glasses where current criminal activities take place, so that he knows where to go to. For facial recognition, he explained that his glasses enable him to execute a scan of all people he sees in such a way to be immediately able to recognize criminals. In the last part of the video, he gave an example of a situation where he and his colleague had a shoplifting case and how he was able to make use of his technology to gain the type of information necessary in this case (see Appendix D for full script).

Moreover, the order of the questionnaires relevant for this specific study will be discussed. Firstly, the variable fear of crime has been asked. Next, one of the nine videos representing one condition has been shown to the participants. Then, the questions to measure trust as well as the questions aiming to measure perceived effectiveness have been asked. Finally, at the end of the survey, the participants were requested to fill out some demographic questions. At this point, it needs to be mentioned that the project was in cooperation with two other students which means that other variables have been measured in the survey as well which are not further discussed and therefore not the focus for this specific study.

Results

General overview

In Table 1 the means, SDs, Cronbach's alphas and correlations among the three measures, age, and gender are displayed. Overall, the measures have high internal reliability and all three measures, as well as gender, were positively correlated with each other. Contrarily, age correlated negatively with the measures and gender.

There were six significant correlations. The first two were between gender and age, as well as gender and trust. Also, gender and fear of crime, as well as age and fear of crime, correlated significantly. Furthermore, as expected, the measures of trust and perceived effectiveness were shown to be moderately positively correlated with each other. The last significant correlation could be shown between fear of crime and perceived effectiveness. However, unexpectedly the correlation was not inverse, but a weak positive one.

In contrast to the expectation of an inverse correlation between trust and fear of crime,

these results indicate a weak, but positive correlation. This is also the only non-significant correlation between the measures.

Table 1

Mean, standard deviations, reliability, and inter-correlations among study variables

	Mean	SD	α	1	2	3	4	5
1 Age	34.20	17.68	-	-				
2 Gender[a]	1.64	0.48	-	-.34**	-			
3 Trust	3.72	0.58	.89	-.09	.25**	-		
4 Perceived Effectiveness	3.57	0.63	.78	-.11	.16	.68**	-	
5 Fear of Crime	1.88	0.61	.84	-.25**	.36**	.10	.19*	-

Note. *p<.05; **p<.01, [a]1=men and 2=women

Hypotheses testing

Before being able to test the hypotheses, two variables out of the nine possible conditions have been created. The first one represents the type of technology used, which enabled to compare the three groups of AR, mobile phone, and traditional. The second one represents the type of information displayed, which enabled to compare the three categories of facial recognition, navigation, and notification. In order to test the hypotheses, a one-way analysis of variance (ANOVA) was conducted. Trust served as the dependent variable and the type of technology as an independent variable. Furthermore, perceived effectiveness, fear of crime, and type of information were used as moderators.

For hypothesis H1 proposing that AR will lead to a higher trust perception compared to the mobile phone and no technology condition, the three groups did not differ significantly from each other, $F(2, 126)=0.16$, $p=.849$. This means that the first hypothesis needs to be rejected. Besides, as can be seen in Table 2, the mean scores of all three conditions are very close to each other.

Table 2

Sample size, mean, standard deviations for trust split up by the type of technology used (AR, mobile phone, traditional)

Type of technology	N	Mean	SD
Augmented reality	46	3.74	0.67

Mobile phone	49	3.71	0.48
Traditional	46	3.72	0.57

Furthermore, for hypothesis H2 which proposes a moderating effect of perceived effectiveness on the relationship between the type of technology used and the level of trust, the main effect between the type of technology and trust was already reported in the first hypothesis and shown to be non-significant. For the second main effect between perceived effectiveness and trust, the results revealed a significant effect, $F(1, 126)=98.56$, $p<.001$. However, the interaction effect between perceived effectiveness and type of technology used remained non-significant, $F(2,126)=0.13$, $p=.874$. This means that the second hypothesis needs to be rejected.

Moreover, for hypothesis H3 which proposes a moderating effect of fear of crime on the relationship between the type of technology used and the level of trust, all effects were non-significant. As reported in the results of H1, the first main effect between the type of technology and trust was non-significant. Also, the main effect of fear of crime on trust could not be shown to be significant, $F(1,126)=0.36$, $p=.552$. The interaction between fear of crime and type of technology used was also non-significant, $F(2,126)=0.27$, $p=.764$. This means that the third hypothesis needs to be rejected.

Finally, for hypothesis H4 proposing a moderating effect of the type of information received by the technology on the relationship between the type of technology used and the level of trust, the main effects, as well as the interaction effect, could not be demonstrated to be significant. As reported for H1, the effect of type of technology on trust was non-significant. The effect of type of information on trust was also shown to be non-significant, $F(2,126)=0.58$, $p=.563$. For the interaction effect between the type of technology and type of information, the results revealed it to be non-significant, $F(4,126)=0.22$, $p=.926$. This means that the fourth and last hypothesis needs to be rejected. In addition, as can be seen in Table 3, for each of the nine conditions the means of trust were close to each other with a span from 3.56 to 3.89. The lowest level of trust could be shown in the condition which combined no technology with facial recognition. The highest level of trust was shown in the condition with AR and navigation.

To summarize the results for the hypotheses, all four hypotheses needed to be rejected. Only the effect of perceived effectiveness on trust could be shown to be significant.

Table 3

Sample size, mean, standard deviations for trust split up by all nine conditions

Condition				
Type of technology	Type of information	N	Mean	SD
Traditional	Navigation	14	3.78	0.60
Traditional	Notification	18	3.81	0.59
Traditional	Facial recognition	14	3.56	0.54
Mobile phone	Navigation	16	3.78	0.56
Mobile phone	Notification	18	3.72	0.50
Mobile phone	Facial recognition	15	3.61	0.38
AR	Navigation	16	3.89	0.36
AR	Notification	15	3.57	0.91
AR	Facial recognition	15	3.74	0.66

Additional explorative analyses

To explore if the type of information received affects the level of trust separately, a one-way ANOVA has been conducted. However, no significant difference between the three types of information could be found, $F(2,138)=1.09$, $p=.338$. In Table 4 it is possible to see that the mean score of trust for the navigation condition was higher than the one for notification and facial recognition.

Table 4

Sample size, mean, standard deviations for trust split up by the type of information (navigation, notification, facial recognition)

Type of information	N	Mean	SD
Navigation	46	3.82	0.50
Notification	51	3.71	0.67
Facial recognition	44	3.72	0.58

Discussion

This study was designed to investigate how the level of trust of citizens is influenced by the usage of AR. In addition, three possible moderators of perceived effectiveness, fear of crime, and the type of information shown by technology have been analysed. Overall, no significant between-group differences could be demonstrated which leads to a rejection of all four hypotheses. In detail, for hypothesis 1 suggesting a higher level of trust of citizens when police are using AR compared to the other two conditions of mobile phones and no technology, the results could not show a significant difference. Additionally, all means were very close together which underlines that there were no between-group differences. As mentioned in the introduction also the study of Sousa et al. (2018) found less convention among citizens regarding how BWCs affect the trust level of citizens. The authors reasoned in their paper that trust is a rather abstract concept, which makes it hard to evaluate. Also, trust seems to be built over a longer period of time and needs an investment of both police and citizens. This reasoning can also be applied here. For this study, the participants were asked to fill out the measure trust based on the video of the police officer they have seen. The question arising here is if it is possible to build trust towards a person you have seen for around one minute, and just in a short video on your screen. Additionally, the participants might already have a fixed level of trust in the police, built over a longer time, which is resistant towards manipulation procedure.

In contrast to the in the introduction discussing a positive effect of new technological implementations on trust (Demir et al., 2020; President's Task Force, 2015; Sousa et al., 2018), it could also be that there is just no difference between which kind of technology is used and its influence of trust. This argumentation is supported by a study of Merola, Lum, Cave, & Hibdon (2014) who investigated when and how citizens support license plate recognition technology. The authors describe that trust does not seem to be influenced by the type of technology used, but it seems that trust depends on how technology is used. Although this finding can also not be supported by the current research, as revealed through the additional explorative analysis, it still serves as an indication that trust does not depend on the technology used. For the implementation of AR in policing this would mean that citizens would not evaluate AR differently from the currently used technologies in terms of trust which facilitates the implementation. To clarify if there is no effect it could help in future studies to use a repeated measure design to know if trust in police is as consolidated as assumed here. Also, a study over a longer period of time would help to see if there are any

changes of trust.

Secondly, for hypothesis 2, the moderating effect of perceived effectiveness on the relation between technology and trust (H1) could not be shown. As mentioned in the results, perceived effectiveness showed a significant effect on trust which is in line with several studies claiming that perceived effectiveness has a positive effect on trust (Heen et al, 2018; Kääriäinen & Sirén, 2011). Reasons, why perceived effectiveness in interaction with the type of technology used did not lead to a significant effect on trust, could lie in the small standard deviation shown for perceived effectiveness which indicates a homogenous perception among all citizens. It seems that citizens have overall a rather high perceived effectiveness perception. Maybe the videos seen by the participants showing a police officer being able to solve the crimes he tackles influenced the participants in such a way that they judged the overall work of police officers as highly effective. Since the results revealed a significant effect of perceived effectiveness on trust, it does not seem to be the case that there is just no effect at all. Thus, further exploration of the interaction by future studies may be interesting.

Thirdly, hypothesis 3, stating a moderating effect of the level of fear of crime on the relationship between AR and trust, could not be supported. Similarly, to the explanation of perceived effectiveness, the overall total score of fear of crime was shown to be relatively low with only a small standard deviation. A reason for this could lie in the sampling procedure used. As convenience sampling has been used for this study, the representativeness of the sample for the population is questionable. All researchers live in Enschede and the areas around there and all focused on sending the questionnaire to their environment which leads to the reasonable assumption that most participants came probably from Enschede itself or areas around there. Recently published data of the Central Bureau of Statistics [CBS] shows a decrease of traditional types of crime over the last years. Also, when looking at how the crime rates differ within the Netherlands, especially the surrounding area excluding Enschede is represented in the lower bound with less than 20 victims per 1000 inhabitants (CBS, 2020). Enschede itself shows a higher crime rate but is still low compared to other cities in the Netherlands, namely Amsterdam, Utrecht or Rotterdam (CBS, 2020). This comparison may indicate that only people of a safe neighbourhood have been asked leading to this homogenous fear perception of crime. Consequently, the moderation did not work out as there was almost no variety in the variable. This means that future studies should try to sample participants of different areas with different criminality rates, as higher crime rates are shown to be correlated with the level of fear of crime (Miceli, Roccato, & Rosato, 2004). This would at least attempt to have a more heterogeneous sample of the level of fear of crime among

participants. However, it could also be that there is just no moderating effect of fear of crime. This could be due to the previously mentioned consolidated level of trust in citizens which in turn then also would not depend on their level of fear of crime.

Regarding hypothesis 4, predicting an interaction effect between the type of technology used and the type of information received on trust, no support could be found. Additionally, an extra explorative analysis about the effect of type of information on trust, could also not be held up. In several studies previously mentioned, the distinction between proactive and reactive stands out (Heen et al., 2018; Sakiyama et al., 2016). This construct could not be supported here. However, a somewhat higher level of trust can be seen in the navigation condition overall as well as precisely in combination with AR. The reason for this finding might be attributable to the familiarity people have for navigation systems. It is something used also in their daily lives, so they know how it works and they know what to expect. In the context of marketing, the familiarity of a brand leads to lower risk perception and a more positive attitude (Rose, Cho, & Smith, 2016). This could explain why there was a higher trust level for the navigation condition. For the implementation of AR in policing this could indicate that the more familiar citizens are with the technology, the more positive they evaluate it and the more they trust it. Maybe it could help to inform citizens and increase their knowledge of the technology in order to be able to implement it as smoothly as possible.

In contrast to the usage of drones where Heen et al. (2018) found that citizens support reactive policing more than proactive ones, there were no differences in this study. A recent study by Bromberg, Charbonneau, and Smith (2020) aiming to test the overt and real support for facial recognition implemented in BWCS, gives an indication for why the findings are contradictory. They figured out that the true support for facial recognition is highest for a younger age group (18-25). People in the middle age group or older age group (26 and above) showed less true support for facial recognition. However, the reason why a decrease of trust for proactive policing strategies, such as facial recognition, could not be supported here, is that half of the sample is 25 or younger. According to Bromberg et al. (2020), this age category supports the usage of facial recognition which consequently leads to the fact that no differences in the level of trust could be shown. For future studies, this would mean that the variable ‘age’ could be an interesting additional factor needed to be analysed in more detail to clarify how the level of trust differs within the different type of information by age.

Limitations

Following, the limitations of this study will be discussed. Firstly, one possible limitation is

that the videos as manipulation might not work out as effectively as planned. However, it needs to be mentioned that originally an experiment with a video in VR-glasses has been planned but due to the Corona crisis, direct contact with participants was not possible. In the online questionnaire, there was no possibility to ensure that participants actively watch the video. As only one or two sentences served as an indicator for which type of technology the police used and which information this type of technology is able to display, highly attentive participants were needed. In addition, it was not possible to ensure that participants kept the information received through the video in mind for answering the dependent variable trust. They needed to rely on their imagination of how they would react if a police officer wears e.g. an AR glasses with a facial-recognition function. Consequently, it could be that rather the overall level of trust in the police has been measured instead of a condition-specific one. For the future, the manipulation procedure could be revised. An idea could be to work with the original idea of a VR glasses experiment in order to make the interaction between the participant and the officer more vivid. Furthermore, a person-to-person experiment should be considered which could assure participants not relying on their imagination only. Having a real police officer in front of you distinguished the situation clearly from seeing one on a screen. Consequently, citizens would be able to think more thoroughly about what technology would change in terms of policing strategies.

As already mentioned, the sampling procedure should also be considered as a limitation. The study aimed at showing how especially Dutch citizens perceive the Dutch police. The sample was a rather homogenous one where only one area of the Netherlands participated. For the future to ensure a better indication of how Dutch citizens perceive the police, a larger-scale study with participants all around the Netherlands should be considered. Moreover, a possible last limitation is the sample size. An increase in people who take part in this survey would increase statistical power and therefore lead to more meaningful conclusions.

Conclusion

This study is one of the first analysing the influence of AR on citizen's perception. The findings are especially important for the future of patrol police officers. Although no significant results were found, one implication of this study is that citizens do not perceive the usage of AR as something negative, but that their level of trust in the police is consolidated and does not depend on the technology used. Another relevant conclusion of this study is that the context of how the technology will be used, so which type of information is shown, needs

more attention for future studies. It seems that how technology is used is more important than which technology is used. However, future studies are needed for further exploration of how citizens perceive AR in policing. Specifically, a more heterogeneous sample, the variable age, as well as a study design aiming to measure more explicitly the actual change of trust in the police need to be considered. The role of citizens for effective policing is crucial, therefore more facets of perception need to be analysed before AR can be fully implemented.

Reference list

Bradford, B., Sargeant, E., Murphy, K., & Jackson, J. (2017). A leap of faith? Trust in the police among immigrants in England and Wales. *The British Journal of Criminology, 57*(2), 381-401. doi: 10.1093/bjc/azv126

Bromberg, D. E., Charbonneau, É., & Smith, A. (2020). Public support for facial recognition via police body-worn cameras: Findings from a list experiment. *Government Information Quarterly, 37*(1), 101415. doi: 10.1016/j.giq.2019.101415

Carmigniani, J., & Furht, B. (2011). Augmented reality: An overview. In Furth, B. (Ed.). *Handbook of Augmented Reality*. (pp 3-46). doi: 10.1007/978-1-4614-0064-6

Carter, D. L., & Carter, J. G. (2009). Intelligence-led policing: Conceptual and functional considerations for public policy. *Criminal Justice Policy Review, 20*(3), 310-325. doi: 10.1177/0887403408327381

Central Bureau of Statistics (2020, 2 March). Minder traditionele criminaliteit in alle delen van Nederland [Dataset]. Retrieved from https://www.cbs.nl/nl-nl/nieuws/2020/10/minder-traditionele-criminaliteit-in-alle-delen-van-nederland

Cowper, T. J., & Buerger, M. (2003). Improving our view of the world: Police and augmented reality technology. *FBI Law Enforcement Bulletin, 77*(5), 62. Retrieved from https://www.ncjrs.gov/App/publications/Abstract.aspx?id=200341

Crow, M. S., Snyder, J. A., Crichlow, V. J., & Smykla, J. O. (2017). Community perceptions of police body-worn cameras: The impact of views on fairness, fear, performance, and privacy. *Criminal Justice and Behavior, 44*(4), 589-610. doi: 10.1177/0093854816688037

Demir, M., Apel, R., Braga, A. A., Brunson, R. K., & Ariel, B. (2020). Body worn cameras, procedural justice, and police legitimacy: a controlled experimental evaluation of traffic stops. *Justice Quarterly, 37*(1), 53-84. doi: 10.1080/07418825.2018.1495751

Hawdon, J. E., Ryan, J., & Griffin, S. P. (2003). Policing tactics and perceptions of police legitimacy. *Police Quarterly, 6*(4), 469-491. doi: 10.1177/1098611103253503

Heen, M. S., Lieberman, J. D., & Miethe, T. D. (2018). The thin blue line meets the big blue sky: Perceptions of police legitimacy and public attitudes towards aerial drones. *Criminal Justice Studies, 31*(1), 18-37. doi: 10.1080/1478601X.2017.1404463

Kääriäinen, J. (2008). Why do the Finns trust the police?. *Journal of Scandinavian Studies in Criminology and Crime Prevention, 9*(2), 141-159. doi: 10.1080/14043850802450294

Kääriäinen, J., & Sirén, R. (2011). Trust in the police, generalized trust and reporting crime. *European Journal of Criminology, 8*(1), 65-81. doi: 10.1177/1477370810376562

Mekni, M., & Lemieux, A. (2014). Augmented reality: Applications, challenges and future trends. *Applied Computational Science*, 205-214. Retrieved from http://www.wseas.us/e-library/conferences/2014/Malaysia/ACACOS/ACACOS-29.pdf

Merola, L. M., Lum, C., Cave, B., & Hibdon, J. (2014). Community support for license plate recognition. *Policing: An International Journal of Police Strategies & Management, 37*(1), 30-51. doi: 10.1108/PIJPSM-07-2012-0064

Miceli, R., Roccato, M., & Rosato, R. (2004). Fear of crime in Italy: Spread and determinants. *Environment and Behavior, 36*(6), 776-789. doi: 10.1177/0013916503261931

Miethe, T. D., Lieberman, J. D., Sakiyama, M., & Troshynski, E. I. (2014). Public attitudes about aerial drone activities: Results of a national survey (Research in Brief report). Las Vegas, NV: Center for Crime and Justice Policy. Retrieved from https://www.unlv.edu/sites/default/files/page_files/27/Research-PublicAttitudesaboutAerialDroneActivities.pdf

President's Task Force on 21st Century Policing (2015). Final report of the President's Task Force on 21st Century Policing. Washington, DC: Office of Community Oriented Policing Services. Retrieved from https://cops.usdoj.gov/pdf/taskforce/taskforce_finalreport.pdf

Priest, T. B., & Carter, D. B. (1999). Evaluations of police performance in an African American sample. *Journal of Criminal Justice, 27*(5), 457-465. doi: 10.1016/S0047-2352(99)00016-1

Reisig, M. D., Bratton, J., & Gertz, M. G. (2007). The Construct Validity and Refinement of Process-Based Policing Measures. *Criminal Justice and Behavior, 34*(8), 1005–1028. doi: 10.1177/0093854807301275

Renauer, B. C. (2007). Reducing fear of crime: citizen, police, or government responsibility?. *Police Quarterly, 10*(1), 41-62. doi:10.1177/1098611106286894

Rose, J., Cho, E., & Smith, K. R. (2016). *The Effects of Brand Familiarity on Perceived Risk, Attitude, and Purchase Intentions toward an Intimate Apparel Brand.* Retrieved from https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1704&context=itaa_proceedings

Sakiyama, M., Miethe, T. D., Lieberman, J. D., Heen, M. S. J., & Tuttle, O. (2016). Big hover or big brother? Public attitudes about drone usage in domestic policing activities. *Security Journal, 30*(4), 1027–1044. doi:10.1057/sj.2016.3

Schafer, J. A., Huebner, B. M., & Bynum, T. S. (2003). Citizen perceptions of police services: Race, neighborhood context, and community policing. *Police Quarterly*, *6*(4), 440-468. doi: 10.1177/1098611102250459

Schakel, J. K., Rienks, R., & Ruissen, R. (2013). Knowledge-Based Policing: Augmenting Reality with Respect for Privacy. In *Discrimination and Privacy in the Information Society* (pp. 171-189). Springer, Berlin, Heidelberg.

Segrave, M., & Ratcliffe, J. (2004). Community policing: A descriptive overview. Retrieved from https://aic.gov.au/publications/archive/community-policing--a-descriptive-overview

Schreurs, W. (2019). Crossing lines together: how and why citizens participate in the police domain. University of Twente. doi: 10.3990/1.9789036548496

Singer, A. J., Chouhy, C., Lehmann, P. S., Walzak, J. N., Gertz, M., & Biglin, S. (2019). Victimization, fear of crime, and trust in criminal justice institutions: A cross-national analysis. *Crime & Delinquency*, *65*(6), 822-844. doi: 10.1177/0011128718787513

Sousa, W. H., Miethe, T. D., & Sakiyama, M. (2018). Inconsistencies in public opinion of body-worn cameras on police: Transparency, trust, and improved police–citizen relationships. *Policing: A Journal of Policy and Practice*, *12*(1), 100-108. doi:10.1093/police/pax015

Stoutland, S. E. (2001). The multiple dimensions of trust in resident/police relations in Boston. *Journal of Research in Crime and Delinquency, 38*(3), 226-256. doi:10.1177/0022427801038003002

Sunshine, J., & Tyler, T. R. (2003). The role of procedural justice and legitimacy in shaping public support for policing. *Law & Society Review, 37*(3), 513–548. doi:10.1111/1540-5893.3703002

Tuttle, O. G., Heen, M. S., Sakiyama, M., Miethe, T. D., & Lieberman, J. D. (2016). Power of Perspective: The Effects of Public Perceptions of Police and Fear of Crime on Attitudes Towards Aerial Drone Use. Retrieved from https://digitalscholarship.unlv.edu/grad_symposium/2016/April18/2/

Tyler, T. R. (2005). Policing in black and white: Ethnic group differences in trust and confidence in the police. *Police Quarterly, 8*(3), 322–342. doi:10.1177/1098611104271105

Tyler, T., & Fagan, J. (2008). Legitimacy and Cooperation: Why Do People Help the Police Fight Crime in Their Communities? *SSRN Electronic Journal*. doi: 10.2139/ssrn.887737

Van Zoonen, L. (2016). Privacy concerns in smart cities. *Government Information Quarterly, 33*(3), 472-480. doi: 10.1016/j.giq.2016.06.004

Weitzer, R., & Tuch, S. A. (2005). Determinants of public satisfaction with the police. *Police Quarterly, 8*(3), 279-297. doi: 10.1177/1098611104271106

Willis, J. J. (2018). Police Technology. *The Handbook of Social Control*, 221-234. doi: 10.1002/9781119372394.ch16

Zhao, J. S., Gibson, C., Lovrich, N., & Gaffney, M. (2002). Participation in community crime prevention: Are volunteers more or less fearful of crime than other citizens? *Journal of Crime & Justice, 25*(1), 41-61.doi: 10.1080/0735648X.2002.9721144

Appendix A

Measure for trust

Gebaseerd op de video van de politieagent die u zojuist gezien heeft, in hoeverre bent u het dan eens met de volgende stellingen:

- Er kan op de politie vertrouwd worden wanneer je ze nodig hebt
- De politie zal je met respect behandelen wanneer je contact met hen zou hebben
- De politie zal iedereen eerlijk behandelen, onafhankelijk van wie ze zijn
- Je kan er vertrouwen in hebben dat de politie in staat is criminaliteit tegen te gaan
- De politie begrijpt welke problemen er in de buurt spelen
- De politie houdt zich bezig met de kwesties die de mensen in de buurt belangrijk vinden
- Over het algemeen heb ik vertrouwen in de politie in het tegengaan van criminaliteit
- De politie doet alles wat ze kan om criminaliteit tegen te gaan
- De politie is deskundig in hun taak om criminaliteit te bestrijden

Five point Likert scale: Helemaal oneens, oneens, neutraal, eens, helemaal eens

Appendix B

Measure for perceived effectiveness

Gebaseerd op de video van de politieagent die u zojuist gezien heeft, in hoeverre bent u het dan eens met de volgende stellingen:

- De politie gaat goed om met problemen die mensen in mijn buurt echt raken
- De politie werkt goed samen met de bewoners in mijn buurt om lokale problemen op te lossen
- De politie levert goed werk om criminaliteit in mijn buurt te voorkomen

Five point Likert scale: Helemaal oneens, oneens, neutraal, eens, helemaal eens

Appendix C

Measure for fear of crime

Hoe vaak maakt u zich zorgen om de volgende zaken:

- Te worden aangevallen terwijl u in een auto rijdt
- Te worden overvallen
- In elkaar geslagen te worden
- Vermoord te worden
- Seksueel misbruikt te worden
- Er in uw huis ingebroken wordt, terwijl er iemand thuis is
- Er in uw huis ingebroken wordt, terwijl er niemand thuis is

Four point Likert: Nooit, soms, vaak, erg vaak

Appendix D

Scriptie videos

Eerste deel video

- Traditioneel
  - *De agent loopt rond - 5 seconden*
  - *Close-up van de agent - 5 seconden*
  - *De agent kijkt om zich heen en maakt aantekeningen - 5 seconden*
- Mobile
  - *De agent loopt rond - 5 seconden*
  - *De agent haalt zijn telefoon uit zijn zak - 2 seconden*
  - *Close-up van de telefoon - 3 seconden*
  - *De politie krijgt meldingen op zijn telefoon en gebruikt deze - 5 seconden*
- AR bril
  - *De agent loopt rond - 5 seconden*
  - *De agent zet zijn AR-bril op - 2 seconden*
  - *Close-up van de AR-bril - 3 seconden*
  - *De agent raakt zijn AR-bril aan, stopt met lopen en kijkt in zijn bril - 5 seconden*

Tweede en derde deel video

Algemene introductie van de politieagent in iedere scenario.

- *Goedendag! Ik ben [naam van de politieagent] en werk nu al een aantal jaar als politieagent in deze stad. Samen met mijn collega's doe ik mijn best om de inwoners van deze stad zo goed mogelijk te helpen. Daarbij proberen wij elke dag deze buurt een beetje veiliger te maken.*
- *Hoe ik te werk ga? Nou, …*

Navigatie traditioneel:

De agent staat een aantal meter van je af. Hij zegt: 'Ik ben opgegroeid in deze stad dus ik kan mijn weg hier goed vinden. Omdat ik de meeste plekken in de buurt goed ken, is het eenvoudig voor mij om snel te gaan naar waar ik moet zijn. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Doordat ik precies de juiste sluiproutes kende, waren we er binnen *no time*.'

Navigatie telefoon:

De agent staat een aantal meter van je af. Hij heeft zijn telefoon in zijn hand. Hij zegt: ‘Ik gebruik mijn telefoon om te zien waar ik moet zijn. Omdat mijn telefoon mij precies laat zien waar ik naartoe moet, is het eenvoudig voor mij om snel te gaan naar waar ik moet zijn. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Doordat mijn telefoon precies aangaf welke sluiproutes we konden nemen, waren we er binnen *no time*.’

Navigatie AR bril:
De agent staat een aantal meter van je af. Hij draagt een AR-bril. Hij zegt: ‘Ik gebruik mijn augmented reality bril om te zien waar ik moet zijn. Omdat mijn AR bril mij precies laat zien waar ik naartoe moet, is het eenvoudig voor mij om snel te gaan naar waar ik moet zijn. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Doordat mijn AR-bril precies aangaf welke sluiproutes we konden nemen, waren we er binnen *no time*.’

Point of interest traditioneel:
De agent staat een aantal meter van je af. Hij zegt: ‘Ik ben opgegroeid in deze stad en ben daardoor goed op de hoogte van de criminele activiteiten die in de buurt plaatsvinden. Omdat ik op de hoogte ben van de plekken waar de meeste criminaliteit voorkomt, weet ik waar ik moet beginnen met kijken wanneer er iets gaande is. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Aangezien ik wist bij welke winkel vaker wordt gestolen, waren we er binnen *no time*.’

Point of interest telefoon:
De agent staat een aantal meter van je af. Hij zegt: ‘Ik gebruik mijn telefoon om op de hoogte te zijn van de criminele activiteiten die in de buurt plaatsvinden door middel van notificaties. Omdat mijn telefoon mij onmiddellijk op de hoogte stelt van waar veel criminaliteit plaatsvindt, weet ik waar ik moet beginnen met kijken wanneer er iets gaande is. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Aangezien mijn telefoon aangaf bij welke winkel vaker wordt gestolen, waren we er binnen *no time*.’

Point of interest AR bril:

De agent staat een aantal meter van je af. Hij zegt: ‘Ik gebruik mijn augmented reality bril om op de hoogte te zijn van criminele activiteiten die in de buurt plaatsvinden door middel van notificaties op de glazen van mijn bril. Omdat mijn AR-bril mij onmiddellijk op de hoogte stelt van waar veel criminaliteit plaatsvindt, weet ik waar ik moet beginnen met kijken wanneer er iets gaande is. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Aangezien mijn AR-bril aangaf bij welke winkel vaker wordt gestolen, waren we er binnen *no time*.’

Gezichtsherkenning traditioneel:
De agent staat een aantal meter van je af. Hij zegt: ‘Ik ben opgegroeid in deze stad, ken praktisch iedereen en kan zo de bekende criminelen eenvoudig herkennen. Omdat ik veel mensen uit deze buurt herken, worden bepaalde zaken eenvoudiger voor mij. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Aangezien ik de verdachte kende en direct wist hoe het gezicht eruit zag van degene die we zochten, hadden we de winkeldief binnen *no time*.’

Gezichtsherkenning telefoon:
De agent staat een aantal meter van je af. Hij zegt: ‘Ik gebruik mijn telefoon om een gezichtsherkenning scan uit te voeren op elk gezicht dat ik invoer, zodat ik bekende criminelen eenvoudig kan herkennen. Omdat mijn telefoon een gezichtsherkenning functie heeft, worden bepaalde zaken eenvoudiger voor mij. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een winkeldiefstal. Aangezien ik de gezichten van de mensen in de winkelstraat kon fotograferen en direct door het gezichtsherkenning programma kon halen, hadden we de winkeldief binnen *no time*.’

Gezichtsherkenning AR bril:
De agent staat een aantal meter van je af. Hij zegt: ‘Ik gebruik mijn augmented reality bril om het gezicht te scannen van de mensen die ik zie, zodat ik bekende criminelen eenvoudig kan herkennen. Omdat mijn AR-bril een gezichtsherkenning functie heeft, worden bepaalde zaken eenvoudiger voor mij. Ik heb laatst nog een situatie meegemaakt, waarin mijn collega en ik werden opgeroepen om zo snel mogelijk naar de hoofdstraat te komen voor een

winkeldiefstal. Aangezien ik de gezichten van de mensen in de winkelstraat kon scannen met mijn AR bril en direct door het gezichtsherkenning programma kon halen, hadden we de winkeldief binnen no time.’