Exploring Effects of Dynamic Guardianship on Perceived Homeowner Safety and Burglar Deterrence

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Abstract

A person's (or group of people's) physical or symbolic presence that functions (intentionally or unintentionally) to prevent a possible criminal event can be defined as guardianship. Previous research has shown that guardianship is impactful in deterring burglars, but it is difficult to achieve, with for example people not feeling capable to be a guardian. Therefore, it is necessary to think of other forms of guardianship. This can be done by finding a way to make individuals feel like someone is watching them when this is not the case. This is what dynamic guardianship aims to achieve, for example, through a pre-programmed camera with a voice, automatic lights, or automatic blinds. Guardianship is usually mainly focussed on deterrence; however, we should also care about a person's feelings of safety. This research aimed to look into possible effects of dynamic guardianship on perceived homeowner safety and perceived burglar deterrence. A virtual reality study was conducted with a sample of 66 participants, divided into two dynamic guardianship conditions and one control condition (camera with voice, automatic blinds, or none). Participants were asked to go into the virtual neighbourhood pretending they were a homeowner looking to buy a house. Results showed that dynamic guardianship manipulations do not influence perceived safety and perceived deterrence. However, it was found that the positive effect of dynamic guardianship on safety and deterrence is larger when willingness to exhibit it is larger . This indicates that dynamic guardianship's effectiveness in increasing people's perceptions of safety and deterrence might depend on people's inclination to take these actions.

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A burglary can be defined as the illegal entering of a building with the aim to commit a crime, particularly theft (Oxford university press, 2024). People are more likely to be fearful of property crimes if they thought they had a high chance of encountering them (Cook & Fox, 2011). An example of this would be a homeowner experiencing fearfulness due to burglaries occurring in close proximity (Lai et al., 2012). Despite this fear, a study by Aboagye-Nimo et al. (2017) showed that new homeowners frequently neglect their burglary prevention because they are complacent about the level of protection in their areas. Such complacency provides burglars with the opportunities they need (Aboagye-Nimo et al., 2017). However, the presence of a guardian has been shown to significantly reduce the likelihood of an attempted burglary (van Sintemaartensdijk et. al., 2021). A person's (or group of people's) physical or symbolic presence that functions (intentionally or unintentionally) to prevent a possible criminal event can be defined as guardianship (Hollis-Peel et al., 2011).

Previous research has shown that guardianship is impactful in deterring burglars, but sometimes difficult to achieve (Reynald, 2017). Therefore, it is necessary to think of other forms of guardianship. One way by which this can be done is by finding a way to make individuals feel like someone is watching them when they are not actually present. This is what dynamic guardianship aims to achieve. For example, this can be done through a pre-programmed camera with a voice, automatic lights, or automatic blinds. This new type of guardianship, dynamic guardianship, is thus presented here.

In the current study, I utilised virtual reality (VR) to test perceived deterrent and perceived safety effects of dynamic guardianship on a sample of student participants. These participants were put into the position of homeowners to-be. A homeowner’s perspective has been chosen because previous research has already looked into perceptions of guardianship with the perspective of a burglar (e.g., van Sintemaartensdijk et. al., 2021). In addition, if homeowners feel safe in their neighbourhood, meaning they believe they are less likely to get burgled, a burglar might perceive it harder to break in and consider their chance to get caught as higher. Specifically, I aim to investigate whether guardianship manipulations, such as automatic blinds or smart cameras could have a positive effect on participants’ perceived safety and deterrence and to what extent possible other variables could influence safety and deterrence.

Burglary and Guardianship

When it comes to crime, Cohen and Felson (1979) argued that according to their routine activity theory (RAT), changes in routine activity patterns can impact crime rates by influencing the convergence of three aspects of direct-contact predatory violations, namely: motivated offenders, appropriate targets, and the lack of capable guardians against a violation. Usually, the absence of even one of these components is enough to stop these offences from happening. For example, when a guardian (which for example could be a neighbour or security personnel) is present, it would lead to the burglars target not being attractive anymore. Additionally, a guardian could deter the offender with its presence before they could even find an appropriate target. In daily life, guardianship can easily be overlooked, since its purpose is to scare of intruders and thus cannot be monitored through the number of violations, or lack thereof, reported. Therefore, in the absence of capable guardians, the likelihood that a violation would occur at any given time and location could be determined by the convergence of potential offenders and suitable targets (Cohen & Felson, 1979). Thus, it remains important to look into what deters an offender while also going more into the types and forms of guardianship that have the biggest impact.

In addition, it has been mentioned that the distinction between a guardian who is simply present and one who is monitoring is arguably subtle. Likewise, a guardian who is merely present may develop into one who is monitoring or intervening. Due to this guardianship ambiguity, perceived risk variations between guardian behaviour dimensions may be quite minimal (van Sintemaartensdijk et. al., 2021).

According to Reynald (2017), offenders are most concerned with being seen, therefore monitoring, natural surveillance, or supervision by guardians to watch over their surroundings is also discouraging to offenders. Such guardianship remains important; however, it is not always attainable, with for example people not being able to be a guardian.

Dynamic Guardianship

As previously mentioned, other forms of guardianship cannot always be maintained or achieved. For example, while a person might be available to be a guardian, they might not be capable enough to prevent crime when necessary (Reynald, 2010). Therefore, to replace the function of the guardian, that is to deter possible offenders, and since offenders are often worried about being seen (Reynald, 2017), it is necessary to find a way in which burglars will feel like they are being watched, without them actually seeing someone present.

There have been several studies going into possible effects of neighbourhood watch signs and ‘watching eyes’ on offenders and whether this leaves the impression of being watched. Symbolic guardianship, which is a type of guardianship that signals to offenders that they may be watched, such as through cameras or watch signs, showed some effects on burglar deterrence, however, this appeared to be a small effect (van Sintemaartensdijk et al., 2022). According to van Sintemaartensdijk et. al. (2022), when neighbourhood watch signs were present, both burglars and non-offenders perceived the neighbourhood to be more inclined to intervene. Additionally, when there were neighbourhood watch signs present, burglars were more likely than non-offenders to choose a target that was closer to the exit. After examining these results, van Sintemaartensdijk et al. (2022), mentioned that the community watch signs may not evoke the feeling of being watched, but rather give the impression that if a neighbourhood resident is encountered, they will be more likely to interfere. This implied that while burglars were not deterred by the signs, they might unconsciously become more cautious, which was not the intended purpose of the neighbourhood watch signs (van Sintemaartensdijk et. al., 2022). In addition, research into watching eyes signs found that participants who were exposed to the watching eyes signs reported stronger feelings of being watched. Additionally, participants did not report an increased perceived chance of victimisation, nor did they report a diminished sense of safety (McClanahan et. al., 2024). These findings indicate that using purely symbolic guardianship, such as neighbourhood watch signs, may not be effective enough in deterring burglars. Instead, it may be beneficial to look more into forms of dynamic guardianship that could actively engage with and monitor potential offenders.

Currently, one of the most researched guardianship measures are neighbourhood watch and actively monitored CCTV (Hollis-Peel et al., 2011). A study by Zurawski and Czerwinski (2002) discovered that, as people saw the enhancement of safety as one of the main aims of CCTV, they thought favourably of CCTV in areas that were heavily trafficked, such as train stations. Additionally, through implicit disciplinary effects of cameras in monitored locations, they were also said to aid in the reduction of challenging and unpleasant situations. However, the use of CCTV as a deterrent to crime did not appear to be correlated with the sense of crime per se, but rather with people’s sentiments of safety and emotional attachment to a particular area (Zurawski & Czerwinski, 2002).

With regards to guardianship effectiveness and burglar deterrents, Johnson and Bowers (2013), anticipated that since there will likely be less people walking around on roads at night, it will be easier for neighbours or bystanders to spot suspicious activity. In such a case, the thought that bystanders could spot suspicious activity would act as a deterrent even if burglars believe this to be true even though it is not. Similarly, cameras may be able to add to this notion by incorporating dynamic guardianship elements such as a pre-programmed voice that gives potential offenders the impression that they are actively being watched, even if they are not. Such deterrents could influence how homeowners perceive their level of safety as well. Perceived feelings of safety were also thought to increase with the implementation of subtle or passive safety and security measures, particularly in residential areas and projects (Aboagye-Nimo et al., 2017).

Further research on what appears to be dynamic guardianship showed some promising results. A study by McClanahan et. al. (2024) looked into dynamic lighting. This describes lighting that is activated or prompted by motion. Motion-activated lights placed around a home to ward off intruders are one typical example. These lights remove the cover of darkness that robbers and intruders prefer to operate under. Participants in the experimental condition who were exposed to dynamic lighting (and sound) reported no perceived lower likelihood of victimisation or greater feelings of safety than those in the control condition. However, this could have been because of the subtleness of the dynamic lighting, making it too subtle to have an effect on their participants (McClanahan et. al., 2024). Therefore, a more significant result could be found with a more noticeable lighting change.

Building on the concept of dynamic lighting, a similar approach might be applied to automatic blinds to deter burglars and increase feelings of safety. . Automatic blinds could convey the feeling that someone is present and potentially watching you, even though they might not be. However, in relation to cameras, I believe blinds might be less noticeable than cameras and thus lead to lower levels of feeling watched, since they appear to be less mainstream and common in daily life. To the best of my knowledge, there is no literature related to automatic blinds and dynamic guardianship. However, I believe this could work well as a form of dynamic guardianship as well. In addition, it is important to see how citizens respond to such measures. Do citizens believe it could be beneficial and increase their feelings of safety while also deterring burglars? Or will they reject dynamic guardianship, stating that it might not work at all and show adverse effects? Dynamic guardianship has strengths and weaknesses, and there are many reasons to conduct research on its possible effects not only on burglars but also that of homeowners themselves.

Current Study

The present study aims to look at whether dynamic guardianship makes people feel safer in a neighbourhood and whether it makes people perceive higher burglar deterrence. Participants were instructed to go through an, in VR constructed neighbourhood as a resident looking to buy a house. While scouting the neighbourhood for houses to buy, they additionally encountered one of three types of dynamic guardianship conditions (automatic blinds, a camera with voice, or control). After leaving the VR neighbourhood, participants filled in a questionnaire questioning their perceived safety and perceived deterrence. It is hypothesised that the presence of dynamic guardianship, such as a camera with voice or automatic blinds, increases participants' perceived safety (Hypothesis 1), with the camera with voice having a higher impact on perceived safety than the blinds (Hypothesis 2).

Additionally, I theorise that the presence of the guardianship conditions increases burglar deterrence within the virtual neighbourhood (Hypothesis 3). In accordance with the previous hypothesis, it is hypothesised that the camera will have a larger impact on perceived deterrence than the blinds (Hypothesis 4). There might be several moderator variables influencing the effect of the conditions on perceived safety and deterrence results, such as feeling watched and whether or not participants noticed the dynamic guardianship manipulations in the environment. It is hypothesised that the positive effect of dynamic guardianship on perceived safety and burglar deterrence is larger when participants feel like they are being watched (Hypothesis 5). Moreover, it is also hypothesised that the positive effect of dynamic guardianship on perceived safety and burglar deterrence is larger depending on whether participants have noticed the dynamic guardianship in the neighbourhood (Hypothesis 6).

Method

Participants and Design

Participants who signed up through SONA were rewarded 1.5 credits for participation. Other participants were recruited via posters, social media, or were asked in person. Additionally, to possibly enlarge the sample size, 25 euros was advertised to one randomly allocated participant. All participants were above the age of eighteen and gave written, informed consent prior to beginning the study. After looking into exclusion criteria, no participants had to be excluded. The study comprised a total sample of 66 people from the University of Twente. Of which 34 (51,5%) men, 31 women (47%), and 1 preferred not so say (1.5%). The mean age was 22 (SD= 1.7). In accordance with the guidelines of the Code of Ethics for Research in the Social and Behavioural Sciences Involving Human Participants, the consent form was created. The University of Twente Ethics Committee approved the study.

For the current study an experimental design was used. The dependent variables were perceived safety and perceived deterrence. The independent variables were automatic blinds and a camera with voice. Possible moderators were feeling of being watched, perception of vulnerability, trait fear of crime, and willingness to exhibit the guardianship measure. A between-subject design was used with participants randomly being allocated to one of three groups (control group (*n*=21), automatic blinds (*n*=22), camera with voice (*n=23*)). Participants were asked to come to the lab for one session, that lasted approximately 45 minutes.

Materials

Virtual Neighbourhood (task)

The Virtual neighbourhood was developed using the Unity pro engine. The Oculus Rift DK head-mounted display (HMD) provided participants with a stereoscopic perspective of the Virtual Environment (VE) and resembled a real life/natural experience of the neighbourhood. Additionally, through the HMD immersive audio was playing, such as: starting cars, birds in the distance, and trees moving in the wind. Participants navigated the VE using two handheld controllers.

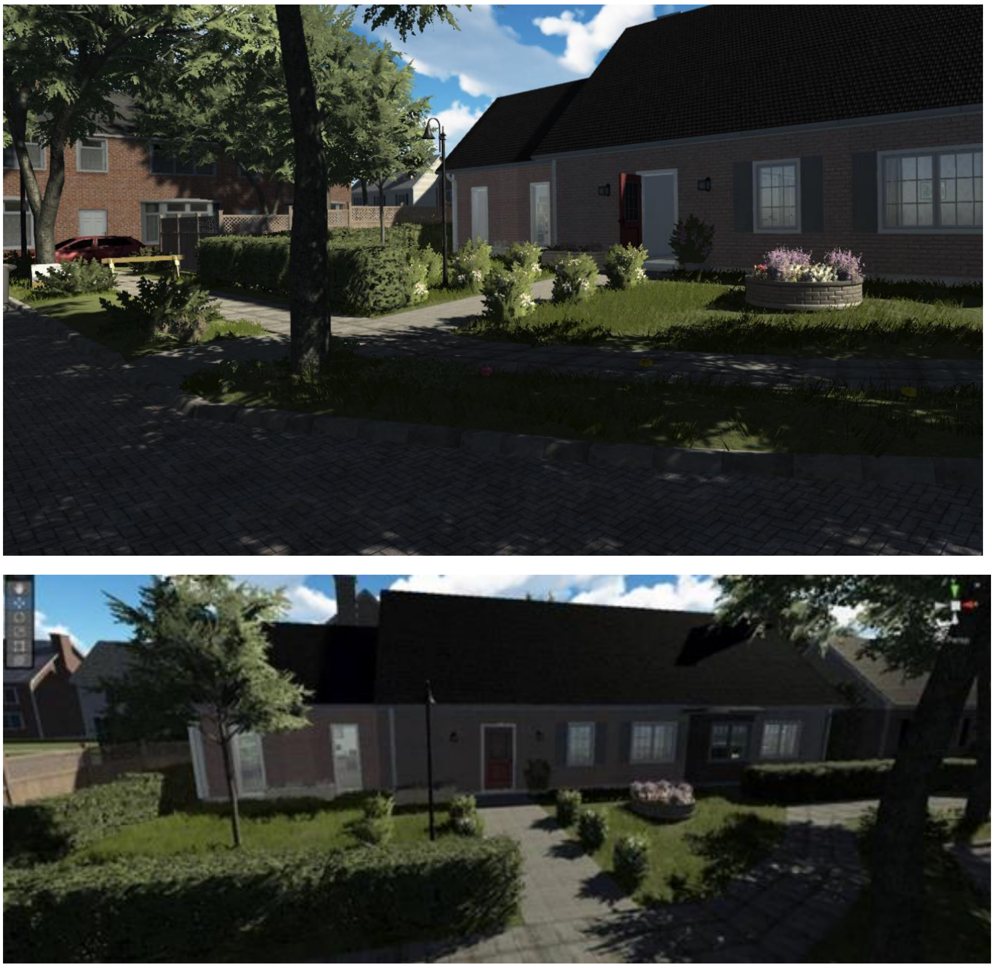
The VE comprised of one street segment and five houses with gardens, all designed to resemble a typical Dutch neighbourhood (see figure 1 and 2). In addition, the neighbourhood contained parked cars and other features such as lampposts, trash cans, and trees. The participants were free to move around and peer inside the houses through the windows, however they could not go inside. Participants, after reading the scenario (see appendix B), were instructed to walk around the neighbourhood as if they were looking to buy a house and were asked to think about which house they would prefer to buy the most. They were asked to take the same things into consideration as they normally would when looking to buy a house.

Figure 1

The VR environment from above

Figure 2 a,b

Participant view from inside of the VR neighbourhood



Guardianship Manipulation

The guardianship manipulations put in the virtual neighbourhood were automatically closing blinds and a camera with voice. Both manipulations were allocated to two houses out of the five (see figure 1, camera: house 2&5, blinds: house 1&4), with neither overlapping each other. The remaining house had no manipulation. When a participant would get close to the entrance of a house with blinds (the trigger zone), the blinds would automatically go down with some noise in one window to the right of the door. Similarly, participants who got close to a house with a camera and moved into the trigger zone, would a voice asking them whether they needed help (“Hello, I see you are looking for something, can I help you?”).

Questionnaires

Manipulation Check. Three items were created to examine to what extent the participants had paid attention to the environment and whether they had noticed any SHDs as well as to see which house they had preferred overall (‘what have you seen in the neighbourhood?’, ‘which house would you like to buy’, and ‘why would you buy this house? (name at least one reason)). The final item showed for what reasons participants had chosen a house, for example because of (dynamic) guardianship interests or for other reasons. The majority of participants (31) preferred house 5, with house 3 (12 participants), 4 (11 participants), 2 (9 participants), and 1(3 participants) being picked less often. Moreover, common reasons for choosing a house were: size of the house, the garden and/or pool, camera presence, feelings of safety, and outside and interior aesthetics.

Feeling of Being Watched. Participants were asked to answer two items related to what amount they had the feeling that they were being watched in the neighbourhood: ‘I felt like I was being watched’ and ‘I felt like there was someone present in the neighbourhood.’ Participants answered on a scale of 1 – 7: 1 = completely disagree, 7 = completely agree (M= 3.0, SD= 1.6, α = .68) (McClanahan et al., 2024).

Perception of Safety.

Safety 1. Participants were presented with six items regarding their perception of safety in the virtual neighbourhood (M= 3.7 , SD= 0.7, α = .78). Four of these items were made by van Sintemaartensdijk et al. (2021): (‘Neighbourhood residents know each other well’, ‘Neighbourhood residents look out for each other’, ‘Neighbourhood residents will call the police when they see crime taking place’, ‘Neighbourhood residents will intervene the police when they see crime taking place’). The final items were added to get a better insight into how safe participants felt on an individual level, in the virtual neighbourhood, as well as the notion that previous research did not provide the additional items we needed (2 items: ‘I felt safe walking alone in this neighbourhood’, and ‘I would feel at home living in this neighbourhood’). The first safety questionnaire was presented before explaining smart home devices (SHD) and notifying participants of its possible presence in the environment. Participants answered on a scale of 1-5: 1 = totally disagree, 5 =totally agree.

Safety 2. After explaining that dynamic guardianship use of SHDs, such as automatic blinds and a camera with voice may have been present in the VR neighbourhood, the perception of safety questionnaire was presented a second time. This was done to check for potential differences in safety perceptions, without the explanation of possibly present SHDs and with the possible presence of SHDs. (M= 3.7, SD= 0.5, α = .71). Participants were also asked whether they had noticed any SHD’s in the virtual neighbourhood (1 item: ‘Did you notice any SHD’s in the neighbourhood you just visited? If so, what were they?’), this was answered with either yes or no, and a text entry for further explanation. This is asked because participants’ (possible) SHD perception could influence and/or alter their responses to the second safety questionnaire and possibly others following. Once again, participants answered on a scale of 1-5: 1 = totally disagree, 5 =totally agree.

Perception of Crime Vulnerability. To infer about the supposed vulnerability to crime (such as getting burgled) of the virtual neighbourhood, two items were created by the researchers: ‘this neighbourhood is likely to be burgled’, and ‘the neighbourhood appears to have low levels of crime’ (M= 3.3, SD= 0.5, α = .65). Participants answered on a scale of 1-5: 1 = completely disagree, 5 = completely agree.

Trait Fear of Crime. A questionnaire comprised of items from Pauwels and Pleysier (2005) was used to assess participants’ fear of crime in general, not from the neighbourhood they saw before. Participants answered items on a scale of 1-5: 1= never, 5= always (M= 2.5, SD= 0.6, α = .79). Pauwels and Pleysier (2005) used indicators from the 1988 Safety Monitor questionnaire to measure fear of crime (4 items: ‘Do you sometimes avoid certain areas in your neighbourhood because you do not consider them safe?’, ‘Does it sometimes happen that you do not open the door to strangers in the evening or at night because you do not consider it safe?’, ‘Do you sometimes avoid leaving home if it is dark?’, ‘Do you sometimes feel unsafe?’). Further items include general feelings of safety as well (4 items: ‘I feel unsafe in my neighbourhood’, ‘The idea that something could happen to me makes me feel limited in my freedom of movement', 'I'm afraid of being robbed in the streets', 'At home I feel safe').

Perceived Deterrence of guardianship measure. Participants were asked to what extent they believe burglars would be deterred by SHDs (such as self-closing blinds and cameras with a voice) in general. Four items were created to measure the perceived deterrence ('Burglars are less likely to burgle a house that has any form of SHD's', 'Burglars are less likely to burgle a house that has self-closing blinds', 'Burglars are less likely to burgle a house that has self-switching lights', and 'Burglars are less likely to burgle a house that has ring cameras') (M= 3.9, SD= 0.6, α = .64). Items were answered on a scale of 1-5: 1 = totally disagree, 5 =totally agree.

Willingness to Exhibit Dynamic Guardianship. To establish how willing participants would be to exhibit dynamic guardianship, a questionnaire was created. Given that the scale seems to measure three factors: safety, convenience, appreciation, and responsibility, a factor analysis was run. The factor analysis showed some cross-loadings between items and no clear factor structure (see appendix D). However, the Cronbach's Alpha for this scale was .69 (M= 3.0, SD = 0.4). Participants were asked to answer 18 items about SHDs (e.g. Not using SHD is a serious threat to my safety', or 'My neighbours or people that live with me will not appreciate it if I install SHDs.') (see appendix C). Items were answered on a scale of 1-5: 1= strongly disagree, 5 = strongly agree.

Game Experience. To determine whether the participants' degree of gaming experience affected their behaviour in the virtual neighbourhood, a game experience questionnaire was created. Items one and two ('How many hours per week do you play games with a controller?', 'How many hours per week do you play games with a keyboard?') were used from van Sintemaartensdijk et al. (2021) to measure general gaming experience. Remaining items were directed towards the Virtual Reality HMD (3 items: 'How many hours per week do you play VR games with a head-mounted display?', 'How experienced are you in dealing with a VR headset / VR game', 'How confident are you in dealing with a VR headset'). For items 1-3 participants were asked to type in hours, and for items four and five the items were assessed on a scale of 1-5: 1= not at all, 5= expert (M= 2.1, SD= 1.6).

Spatial Presence Experience Scale. Presence was measure by an adapted version of the 8-item short Spatial Presence Experience Scale made by van Sintemaartensdijk et al.

(2021), (*M*= 3.3 , *SD*= 0.7, α = .78). This questionnaire measured to what extent participants felt present in the virtual neighbourhood (8 items: ‘I felt like I was actually in the virtual neighbourhood’, ‘I felt like I was part of the virtual environment’, ‘It felt like I was physically present in the virtual environment’, ‘The items in the virtual environment gave me the feeling I could use them’, ‘I felt I could be active in the virtual environment’, ‘I felt I could move around the items in the virtual environment’, ‘It felt like I could do anything I wanted in the virtual environment’). Participants answered the items on a scale of 1-5: 1 = strongly disagree, 5 = strongly agree.

Cyber Sickness. To assess whether participants felt any cyber sickness during the experiment, an adapted version of the Simulator Sickness Questionnaire, made by van Sintemaartensdijk et al. (2021), was used (*M*= 2.1 , *SD*= 1.0, α = .83). Participants answered on a 5-point scale (strongly agree- strongly disagree) (5 items: ‘The virtual environment made me nauseous.’, ‘The virtual environment made my stomach ache.’, ‘The environment made me dizzy. ‘, ‘The environment made me lack focus.’, ‘The environment blurred my vision.). Participants answered the items on a scale of 1-5: 1 = strongly disagree, 5 = strongly agree.

Demographics. Finally, at the end of the questionnaire, participants were asked to provide some demographic information. These were age, gender, country of origin, and highest completed or currently completing education.

Procedure

The research took place in the Flexperiment lab in the Cubicus building at the University of Twente. Upon entering the laboratory, participants were seated in front of a PC with Windows 11 and equipped with the Oculus HMD. Once the participant was seated, they were asked to read and sign the informed consent shown in Qualtrics or withdraw if not. After consent, a scenario was presented explaining the task and the content of the experiment. Participants were randomly assigned to one of the three conditions (blinds, camera with voice, control). After the scenario, the HMD was introduced, it was explained how they could move around the environment with the controllers, and where they were and were not able to go. Additionally, participants had the opportunity to ask questions and it was made clear that if they would like to exit the environment they can walk towards the roadblocks at the end of the street. Once the participants were finished with the environment, the devices were handed back to the researchers and the participants started filling in the questionnaires. After they had finished the questionnaires, participants were fully debriefed about the nature of the study and were given the chance to withdraw their consent for participation.

Data Analysis plan

To analyse the data collected from the task, as well as the questionnaire data researchers used the R Studio program. To test the main hypotheses, I performed a general linear model with the independent variable Condition on each of the dependent variables Safety 1, Safety 2, and Perceived burglar Deterrence, to show the possible influence of Condition on these dependent variables. In the case of main effects of the dependent variable on the independent variables, a post-hoc test was conducted to test for differences within the Conditions. Additionally, an exploratory analysis tested Feeling watched, Perception of SHD (did participants notice any SHDs), Perception of crime vulnerability, (trait) Fear of crime, and Willingness to exhibit dynamic guardianship as possible moderators for all analyses, since I believe they could potentially affect participants neighbourhood perception and related perceptions of neighbourhood Safety and burglar Deterrence. To check for moderation effects, every possible moderator was tested separately with a linear model analysis along with the Conditions on the dependent variables. Finally, in the case of interaction effects, simple slope analyses were performed.

Results

Preliminary analysis

To infer about possible differences within Presence, Cyber sickness, and Game experience across conditions (camera with voice, automatic blinds, and control), three separate linear model analyses were conducted with Condition as the predictor. The linear model analyses showed no significant results for cyber sickness ($F(1,64)= 0.082$, $p = .776$, $f^2 = .0013$), Presence ($F(1,64)= 1.58$, $p = .214$, $f^2 = .025$), and Game experience ($F(1,64)= 0.78$, $p = .381$, $f^2 = .012$). This indicates that the conditions did not influence participants' perceptions of Cyber sickness, Presence, and reported Game experience scores, meaning they are independent from the dynamic guardianship conditions.

Moreover, looking at the means for whether participants noticed the SHDs, participants form the blinds condition appeared to notice the SHDs less than the camera condition. After a linear model analysis, results show a significant effect of Condition on whether participants noticed SHDs ($F(1,64)= 7.03$, $p = .00101$, $f^2 = .11$). Furthermore, a chi-squared test, testing for differences between conditions, showed no significant effects for the comparisons between control vs blinds ($\chi^2(1, N = 66) = 0.19$, p-value = .665), and blinds vs camera ($\chi^2(1, N = 66) = 2.45$, p-value = .117), whereas there was a significant effect for control vs camera ($\chi^2(1, N = 66) = 5.13$, p-value = .0235). For further understanding, a post-hoc comparison test with Bonferroni correction was conducted. This confirmed that there were no significant differences between control vs blinds ($p_{Bonferroni} = 1.00$), and blinds vs camera ($p_{Bonferroni} = 0.232$). However, the results confirmed the significant differences between control vs camera ($p_{Bonferroni} = 0.033$). Therefore, the camera condition influenced whether participants noticed the SHDs.

For variable means and standard deviations, refer to table 1. The table below allows for the visualisation of the data used for both main and interaction analyses and exploratory analyses. In this table, the between condition (blinds vs camera vs control) means can be seen.

Table 1

Means and Standard Deviations of all Questionnaire Variable Scores per Dynamic Guardianship Condition

Variable	Automatic blinds, *M* (*SD*)	Camera with voice, *M* (*SD*)	No active dynamic guardianship, *M* (*SD*)
Perceived safety 1	3.6 (0.7)	3.6 (0.8)	3.9 (0.5)
Perceived safety 2	3.7 (0.6)	3.7 (0.5)	3.8 (0.5)
Perceived deterrence	3.8 (0.6)	3.8 (0.6)	4.0 (0.5)
Willingness to exhibit dynamic guardianship	3.0 (0.4)	3.0 (0.3)	3.0 (0.5)
Feeling watched	2.9 (1.4)	3.2 (1.8)	2.8 (1.6)
Vulnerability to crime	3.3 (0.4)	3.4 (0.5)	3.2 (0.4)
Fear of crime	2.5 (0.7)	2.4 (0.6)	2.5 (0.6)
Noticed SHD (yes = 1, no = 0)	0.7 (0.5)	0.9 (0.3)	0.6 (0.5)
Cyber sickness	2.2 (1.1)	2.1 (1.2)	2.0 (0.9)
Presence	3.4 (0.6)	3.2 (0.8)	3.4 (0.7)
Game experience	2.5 (1.8)	2.1 (1.5)	1.7 (1.2)

Perception of Safety (1 &2)

The linear analysis showed that there were no apparent main effects of Condition on both Safety 1 ($F(1,64)= 2.05$, $p = .157$, $f^2 = .032$) and on Safety 2 ($F(1,64)= 0.88$, $p = .352$, f

^{2} = .014). This was not in accordance with the hypothesis, meaning that dynamic guardianship does not appear to impact participants' perceptions of safety.

Additionally, a linear model analysis tested for both the moderation hypotheses (5-6) and exploratory analyses whether there were any interaction effects of variables with Condition on Safety 1 and 2. As can be seen in table 2, no significant effects were found for Perceived neighbourhood Vulnerability to crime, Fear of crime, Feeling watched, and noticing SHDs on both Safety dependent variables (1 &2).

Table 2

Linear Model Analysis Results for all Non-Significant Main and Interaction Effects of Possible Moderation Variables on Safety (1 &2).

Variable	*p*
Dependent variable: Safety 1	
Condition	.525
Vulnerability	.502
Condition and Vulnerability	.406
F statistic	0.93 (3,62)
f squared	.045
Dependent variable: Safety 2	
Condition	.752
Vulnerability	.921
Condition and Vulnerability	.670
F statistic	0.58 (3,62)
f squared	.028
Dependent variable: Safety 1	
Condition	.950
Fear of crime	.799
Condition and Fear of crime	.786
F statistic	0.69 (3,62)
f squared	.033

Variable	*p*
Dependent variable: Safety 2	
Condition	.867
Fear of crime	.847
Condition and Fear of crime	.953
F statistic	0.45(3,62)
f squared	.022
Dependent variable: Safety 1	
Condition	.553
Feeling watched	.531
Condition and Feeling watched	.970
F statistic	1.76 (3,62)
f squared	.085
Dependent variable: Safety 2	
Condition	.326
Feeling watched	.201
Condition and Feeling watched	.490
F statistic	1.47 (3,62)
f squared	.071
Dependent variable: Safety 1	
Condition	.531
SHDs noticed	.702
Condition and SHDs noticed	.919
F statistic	0.85 (3,62)
f squared	.041
Dependent variable: Safety 2	
Condition	.807
SHDs noticed	.244

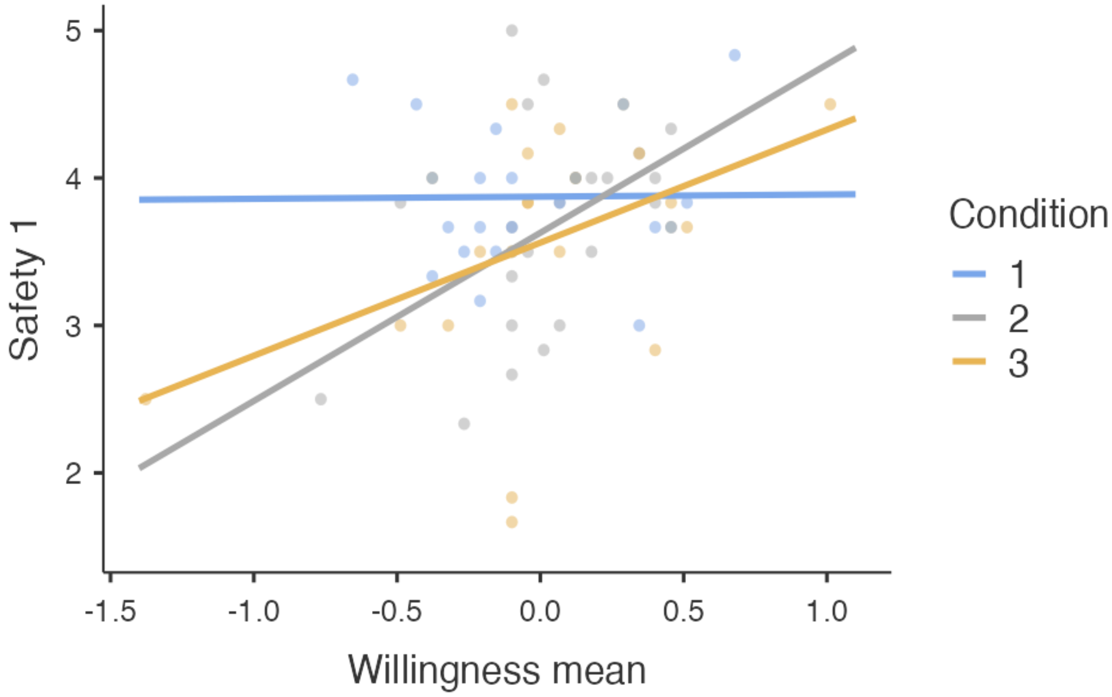
Variable	p
Condition and SHDs noticed	.381
F statistic	0.84 (3,62)
f squared	.040

However, for the Willingness variable, interaction effects were found to be significant for both Safety 1 ($F(3,62) = 4.26$, $p = .00844$, $f^2 = .21$) (see figure 3) and Safety 2 ($F(3,62) = 3.21$, $p = .0291$, $f^2 = .16$) (see figure 4). A simple slope analysis was performed to interpret the interaction effect differences between Conditions. For safety 1, when comparing low Willingness (-1*SD* below the mean) between conditions, significant differences in effect were found across conditions ($B = -.28$, $z(60) = -2.25$, $SE = .13$, $p = .025$). However, no significant differences were found for average ($B = -.16$, $z(60) = -1.70$, $SE = .094$, $p = .089$) and high Willingness (+1*SD* above the mean) ($B = -.035$, $z(60) = -0.28$, $SE = .13$, $p = .0783$). Thus, when there is average or high Willingness to exhibit dynamic guardianship, there are no differences across the conditions on safety scores. This means that the differences in higher safety scores among conditions are not influenced by the willingness to exhibit guardianship.

In contrast to Safety 1, low Willingness (-1*SD* below the mean) did not show significant differences between conditions in Safety 2 ($B = -.14$, $z(60) = -1.46$, $SE = .099$, $p = .143$). Additionally, no significant associations were found for average ($B = -.086$, $z(60) = -1.17$, $SE = .073$, $p = .241$) and high Willingness ($B = -.027$, $z(60) = -0.27$, $SE = .10$, $p = .786$).

Figure 3

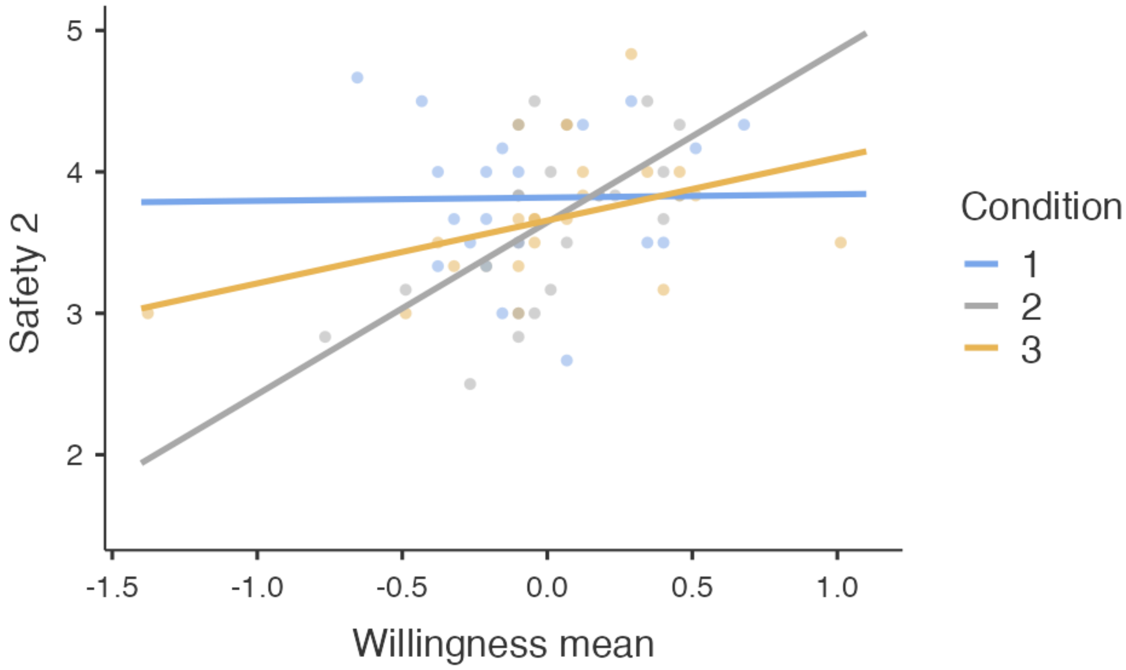
Plot Showcasing the Association Between Willingness to Exhibit Dynamic Guardianship and Perceived Safety 1, with Individual Lines per Condition (1= Control, 2= Automatic Blinds, 3= Camera with Voice).



Note. Each dot represents an individual participant.

Figure 4

Plot Showcasing the Association Between Willingness to Exhibit Dynamic Guardianship and Perceived Safety 2, with Individual Lines per Condition (1= Control, 2= Automatic Blinds, 3= Camera with Voice).



Note. Each dot represents an individual participant.

Finally, a linear model was used to assess whether there was a possible moderation effect of whether participants noticed SHDs with Condition on Safety 1 and 2. There was no significant effects found for Condition on Safety 1 ($F(3,62) = 0.85$, $p = .531$), Perceived SHDs on Safety 1 ($F(3,62) = 0.85$, $p = .702$), and no interaction effect found for Perceiving SHDs with Condition on Safety 1 ($F(3,62) = 0.85$, $p = .919$, $f^2 = .041$). Additionally, results for Safety 2 indicated no significant effect for Condition on Safety 2 ($F(3,62) = 0.85$, $p = .807$), Perceived SHDs on Safety 2 ($F(3,62) = 0.85$, $p = .244$), and for interaction effect for Perceived SHDs either ($F(3,62)= 0.84$, $p = .381$, $f^2 = .040$).).

In summary, results were not significant for the main effect of Condition on Safety (1&2), as well as for the interaction effects of Crime vulnerability, fear of crime, and feeling watched. In contrast, there was a significant interaction effect of Willingness on the condition and safety variables, which showed that (as seen in figure 3 and 4) across the guardianship conditions, low willingness led to lower safety scores and high willingness led to higher safety scores. Additionally, a simple slope analysis showed that there were significant Willingness differences among conditions in Safety 1, however this was not significant in Safety 2. Moreover, it became apparent that there were no interaction effects of Perceived SHDs on Safety 1 and Safety 2.

Perceived Burglar Deterrence

Whether there was a relation between Condition and Deterrence scores was tested with a linear model with Condition as independent variable and Deterrence as the dependent variable. The main effect for Condition on Deterrence was not significant as ($F(1,64) = 0.67$, $p = .416$, $f^2 = .010$). Moreover, to assess whether there were any potential moderating effects on Deterrence scores, additional linear model analyses were performed. As shown in table 3, the linear model showed that there were no significant moderation effects of Feeling watched, Fear of crime, Vulnerability to crime, and Perception of SHDs with Condition on Deterrence.

Table 3

Linear Model Analysis Results for all Non-Significant Main and Interaction Effects of Possible Moderation Variables on the Dependent Variable: Perceived Deterrence

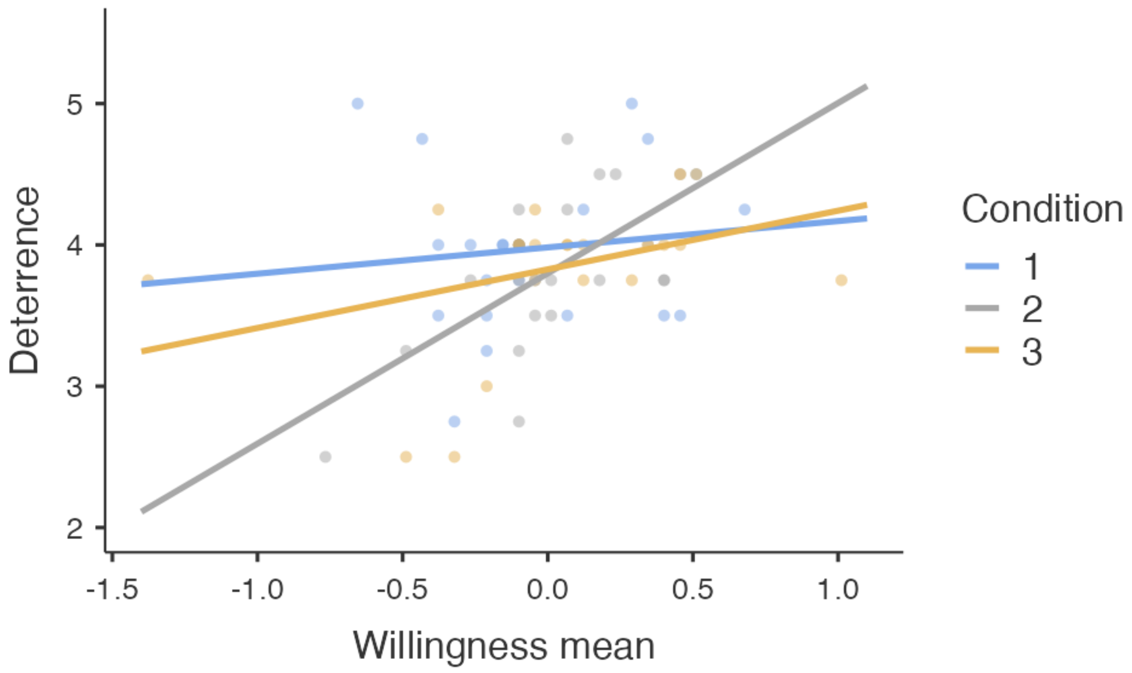
Variable	*p*
Condition	.330
Feeling watched	.573
Condition and Feeling watched	.509
F statistic	0.39 (3,62)
f squared	.019
Condition	.901
Fear of crime	.569
Condition and Fear of crime	.921
F statistic	1.38 (3,62)
f squared	.067
Condition	.557
Vulnerability	.488
Condition and Vulnerability	.479
F statistic	0.37 (3,62)
f squared	.018
Condition	.395
Noticing SHDs	.311
Condition and Noticing SHDs	.200

Variable	p
F statistic	0.84 (3,62)
f squared	.041

For the Willingness variable, a significant interaction effect was found however (F(3,62)= 2.96, p = .0390, f^2 = .14). As can be seen in figure 5, higher Willingness leads to higher Deterrence. Likewise, low Willingness shows lower Deterrence scores. Furthermore, simple slope results showed no significant differences between conditions with low (-1*SD* below the mean) (B = -.11, z(60) = -1.03, SE = .10, p = .304), average (B = -.082, z(60) = -1.06, SE = .077, p = .290), or high (+1*SD* above the mean) Willingness (B = -.056, z(60) = -0.54, SE = .11, p = .592). This means that, no matter the level of Willingness, there were no significant differences between guardianship conditions and their reported Deterrence scores.

Figure 5

Plot Showcasing the Association Between Willingness to Exhibit Dynamic Guardianship and Perceived Burglar Deterrence, with Individual Lines per Condition (1= Control, 2= Automatic Blinds, 3= Camera with Voice).



Note. Each dot represents an individual participant.

To summarise, the main effect of Condition on Deterrence and most interaction effects (Feeling watched, Fear of crime, Vulnerability to crime, and noticing the SHDs) were not significant, which was not in accordance with the hypothesis. An exploratory analysis found that there was a significant interaction effect of Willingness with Condition on Deterrence scores, however, there were no significant differences between conditions.

Discussion

In this study I aimed to find out whether dynamic guardianship (camera with voice and automatic blinds) had an effect on Perceived safety and Perceived deterrence when in a virtual neighbourhood as someone looking to buy a house. Additionally, I was interested in possible differences between types of dynamic guardianship on Perceived safety and Deterrence. Results showed that there were no significant results for condition effects on either safety nor deterrence, indicating that, when it comes to perceived increased safety and deterrence, it does not matter whether there is any dynamic guardianship in the neighbourhood. Participants did not feel safer with dynamic guardianship present. This was not in line with the expected hypothesis. Moreover, the results showed a significant interaction effect of Willingness to exhibit dynamic guardianship with condition on both safety and deterrence. For Safety 1, when there were lower willingness scores, there appeared to be larger differences between guardianship conditions in participants' perceived safety and deterrence scores. Whereas high willingness scores did not seem to influence differences between dynamic guardianship conditions on Safety 1 scores. However, for both Safety 2 and Deterrence scores there were no differences between guardianship conditions with both low and high willingness to exhibit dynamic guardianship. This means that the willingness to exhibit dynamic guardianship combined with the (presence of) dynamic guardianship seemed to only influence scores for Perceived safety 1.

The Impact of Willingness

As indicated before, a significant moderation effect was found for Willingness to exhibit dynamic guardianship on increasing perceived Safety 1. Previous research into physical guardianship found that personal safety may be at risk while intervening, particularly in cases of violent assault (Nagin et al., 2023). This risky aspect of helping influences how potential guardians weigh their motives to act against the possible consequences of helping. Consequently, Nagin et al. (2023) states that credible threat of bodily harm discourages direct intervention, leading to only those who believe they are capable of successfully intervening more willing to act immediately to disrupt a conflict. On the basis of that, dangers to one's own safety serve as a strong disincentive to reactive guardianship (Nagin et al., 2023). In other words, a person's willingness to act as a physical guardianship was influenced by their own personal feelings of safety as well as confidence in their capability to act accordingly. This is in accordance with the belief that not everyone is capable of being or wants to be an active physical guardian. Similarly, the current research found that lower Willingness to exhibit dynamic guardianship in the camera and blinds conditions led to lower perceived Safety as well. Therefore, looking further into willingness to exhibit dynamic guardianship could show promising results, both in terms of confidence in exhibiting dynamic guardianship and increasing feelings of safety.

Moreover, Reynald (2010) looked into what makes a capable guardian. Interviewees revealed that the willingness to take action, was what distinguished a capable guardian from others. The degree of guardianship at a place was determined by a guardian's willingness to watch their surroundings and intervene in cases of illegitimate activity. This monitoring trait, was said to build contextual knowledge and awareness, leading to enhanced intuition of suspicious others, and in turn enhanced the guardian's confidence to actively prevent crime. Additionally, a factor that influenced guardian's willingness to intervene was safety. Interviewees stated that they were more willing to intervene when their personal safety was unlikely to be jeopardised. However, if their own property or family was under threat, they were more willing to intervene once again (Reynald, 2010). Therefore, what makes a capable guardian likely to intervene is their willingness to do so. However, there are factors, such as personal safety, that affect this willingness to act. In dynamic guardianship for example, and in the current study, the possibility of risking personal safety when intervening becomes much smaller, since there will be no physical interventions. This could then influence a person's willingness to exhibit dynamic guardianship, as willingness has currently influenced perceived safety as well.

A study by Bankiewicz and Papadouka (2023) found that people of lower socioeconomic status are more often afraid of crime and more likely to invest in cheaper security measures, whereas people of higher socioeconomic status are less afraid of crime and more likely to invest in home security measures in general. They mentioned that these differences might be because less advantaged people feel a greater need to secure their houses but can only afford the cheaper deterrent measures (Bankiewicz & Papadouka, 2023). In accordance, Aboagye-Nimo et al. (2017), states that cost is one of the main barriers between homeowners and deciding to buy additional security features, such as surveillance or burglar barriers. Homeowners believe that such home modifications are too expensive to pay upfront. Thus, cost could be another variable affecting willingness to exhibit (dynamic) guardianship.

Finally, the use of VR in the current study can be said to have been advantageous, as it might have made perspective-taking easier than previous studies have done. Kuznik (2023) looked into willingness to exhibit multiple types of guardianship, such as symbolic and dynamic guardianship, when taking on different perspectives in a 2D neighbourhood. After participants were exposed to multiple different perspectives, it was thought that participants placed a higher value on the possible advantages of dynamic and symbolic guardianship. However, results showed no significant effect for perspective-taking on willingness to invest in dynamic or symbolic guardianship. This was believed to be because of difficulties taking on the perspectives, for example that of a burglar or a victim. Thus, it is possible that, in the current study, taking the perspective of homeowner looking to buy a new house is easier for participants to adopt to than that of a burglar or a victim. Additionally, conducting a study within a VR an environment also has the advantage of being able to change a user's perception of the environment to whichever seems most fitting. For example, a first-person view ensures that participants will see the environment through the virtual avatar's eyes and thus have the ability to take its perspective (Mihelj, 2014).

Dynamic Guardianship on Safety and Deterrence

No significant effects were found of the guardianship manipulation on perceived neighbourhood safety and no effects were found on perceived neighbourhood burglar deterrence. Thus, the camera with voice, and the automatic blinds appeared not to increase participants perceived safety and deterrence in the neighbourhood. Similarly, a study by Cozens and Davies (2013), looked into the effects of shutters in individual homes on perceived burglary risk, levels of street surveillance, levels of social interaction, and levels of safety. Results showed that although shutters were thought to reduce crime, this was at the cost of reduced street surveillance, social contact, and personal feelings of safety. While shutters are not the same as blinds, they do have similar purposes. Interestingly, in both this and the current study, there appeared to be no increased perceived feeling of safety with the use of shutters/blinds.

Previous studies showed that perceived feelings of safety increase when there is implementation of subtle or passive security and safety measures (Aboagye-Nimo et al., 2017). The present study did not appear to have increased perceived safety when the guardianship manipulations were presented. In addition, this indicates that participants did not think that the manipulations led to increased burglar deterrence. A reason for this might be that the measures were not subtle or passive enough for participants to increase their feelings of safety, since many participants reported to notice the guardianship measure in the VR environment as well as a significant effect showing a relation between noticing SHDs and the Conditions.

According to Reynald (2017) monitoring and surveillance is discouraging to burglars, since they are usually most concerned with being seen. However, they did not look into the impact of adding preprogrammed sounds or voices to cameras. While, dynamic guardianship cameras were believed to possibly have a (perceived) deterrence effect, participant results showed no apparent effects of such a camera on perceived burglar deterrence. This indicates that while monitoring is shown to be discouraging, monitoring cameras with a prerecorded voice did not have such a discouraging or deterrent effect.

Strengths and Limitations

First of all, quite some participants were recruited through convenience sampling, leading to numerous participants who knew the researchers. This could have led to adjusted motivation or focus during the experiment. For example, participants might have paid less time in and attention to the virtual environment as they were trying to finish the study quickly.

Additionally, during the VR part of the experiment, there were times were a glitch or an error occurred in the environment. Such as no sound, low eyelevel (feeling very short), or having to restart the program and/or the Oculus. These could have influenced some results and/or participants' ability to perceive certain guardianship measures. There were also some participants who reported feeling cyber sickness throughout the VR experiment. Kim et. al., (2021) mentions that cyber sickness has been reported to induce symptoms such as difficulty focusing and noticing visual fatigue. Therefore, such feelings might have led to further difficulty noticing SHDs and paying attention to the VR neighbourhood.

As has been mentioned beforehand, perspective taking can have some difficulties. It might have been that participants had issues with taking the perspective of someone looking to buy a house, since they were students. However, as shown in the case of Kuznik (2023), it can be said that compared to a non-VR environment, the use of VR is probably still one of the best options when it comes to taking someone's perspective.

One strength of the current study is that new insight into home buyers' view on dynamic guardianship, and dynamic guardianship in general is provided. Which was done by putting participants in the point of view of a homeowner looking to buy a house in the VR neighbourhood and asking them about their perceptions of the neighbourhood afterwards. In addition, I expanded on guardianship literature in a way that there has been no previous (as far as I know) research into the use of automatic blinds and prerecorded cameras as a form of dynamic guardianship. Moreover, the realistic VR environment, with added natural background noises, and the in person contact ensured that participants had the opportunity to be present and immersed during the experiment itself. Mihelj (2024) states that, in VR, real-world sensations are frequently drowned out by synthetic ones, reducing presence in the real world and increasing physical and mental presence in the virtual environment (Mihelj, 2014).

Future research

It could be interesting to look into dynamic guardianship effects in different settings, beyond the VR environment. For example, we could check for differences between high class, middle class, and lower-class neighbourhoods, or rural versus urban areas. Such differing areas could give further insight into factors influencing perceived safety and perceived burglar deterrence. For instance, a study by Moir et al. (2019), found that the type of housing usually seen in the suburban environment of Brisbane had no effect on the disparities in guardianship intensity among homeowners of the area. They also revealed that certain neighbourhood characteristics (such as surveillance and accessibility) were associated with residents' guardianship intensity. Additionally, while it might be harder to conduct, it could be interesting to make actual homeowners look at a house (whether in VR or in real life), one condition with and one without dynamic guardianship. To then look into to what extent it influences their opinion of the house and the perceived safety and deterrence surrounding it.

Finally, to provide more insights into participants' willingness to exhibit dynamic guardianship, future studies could focus on investigating personal or demographic interests that influence and lead to higher acceptance of dynamic guardianship. For example, it could be interesting to look into gender differences and their willingness to exhibit dynamic guardianship. Previous research by Cook and Reynald (2016), showed that, when it came to physical guardianship, men felt greater confidence in their psychical ability to intervene directly. Whereas women were more inclined to interfere indirectly and show a higher willingness to help (Cook & Reynald, 2016). Perhaps similar differences arise between genders when looking into dynamic guardianship.

Conclusion

This study aimed to explore possibly enhancing effects of dynamic guardianship withing a VR environment on perceived safety and deterrence. A significant interaction effect of willingness to exhibit dynamic guardianship with dynamic guardianship suggests that dynamic guardianship's effectiveness in increasing people's perceptions of safety and deterrence might depend on people's inclination to take these actions. Thus, while the results of this study did not show that dynamic guardianship had a significant effect on perceived deterrence or perceived safety, significant willingness to exhibit guardianship effects opens up new research routes. Understanding individual differences in willingness and the reasons for it, could improve implementation and effectiveness of dynamic guardianship measures in the future, promoting safer communities and more effective crime deterrence strategies.

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Appendix A

Informed consent and debriefing

Informed Consent

Dear participant,
Thank you for choosing to participate in this study. The study aims at looking into how citizens perceive the safety of Dutch neighbourhoods, and what we can learn from these perceptions in order to create better deterrent measures to deter burglars.

Procedure
Participation in this study takes maximum 45 minutes. You will walk around a neighbourhood using a virtual reality headset and telling us what you think of this neighbourhood. Afterwards, you will answer questions on the realism of the neighbourhood and how you perceived this neighbourhood.

Potential Risks and Discomforts
There are no obvious physical, legal, or economic risks associated with your participation in this study. If, however, you feel a little nauseous due to being in a virtual reality you can always stop or pause the study.
This research was reviewed and approved by the BMS Ethics Committee of the University of Twente. For questions or problems regarding ethics of the study, the Secretary of the Ethics Commission of the faculty Behavioural, Management and Social Sciences at University Twente may be contacted through ethicscommittee-bms@utwente.nl.

Potential Benefits
If you have signed up over SONA you will receive 1.5 points for participation.

Confidentiality
Your privacy will be protected to the maximum extent allowable by law. Since your responses are completely anonymous, no data, such as names, is being collected that can be traced back to you. Your response is only used for scientific research. In case of a withdrawal, your data will be deleted immediately.
Right to Withdraw and Questions
Your participation is voluntary. If you participate, you may decide to withdraw from the study at any time. You will not be penalized or lose any benefits to which you otherwise quality if you decide to not to participate or to stop participating. If you have questions or concerns regarding this research, please contact us.

Contact Information
Dr. Iris van Sintemaartensdijk (i.vansintemaartensdijk@utwente.nl)

Statement of Consent
By checking the box below, you confirm that you are at least 18 years of age, you have read and understood all the information, give your consent, and that you voluntarily agree to participate in this study.

- I have been sufficiently informed about the study and all my questions are answered to my satisfaction

- I have the right to withdraw from the study at any time
- I have understood that no personally identifiable information will be reported in the research report and confidentiality is ensured

If you do not agree to this, end the study by leaving the website.

Debriefing

Thank you for participating in this study.

In this study, we looked at the perceptions of citizens on safety of neighbourhoods. For the purpose of this study we did not tell you that you were in one of three conditions where dynamic guardians were placed in the neighbourhood.

A dynamic guardian is the combination of a physical guardian, such as a person being present in front of the house, and a symbolic guardian, such as a sign indicating a neighbourhood has a Neighbourhood watch group. In the context of the study the dynamic guardian was a technical device that was supposed to leave the impression that a person was home when in reality nobody was in the house. This could either be automatic lighting in a house, curtains that were closed or a camera with sound. You could also have been allocated to the control condition where no such measures were present.

We want to see if people feel more safe in a neighbourhood when such measures are present, or if these measures make people feel as if a neighbourhood is less safe because there are many protection measures.

Please do not share the content of this study with other potential participants to allow them an unbiased view in case of participation.

Do you have any other question right now? Please let the researchers who are present now know. If more questions arise later, you can contact Dr. Iris van Sintemaartensdijk (i.vansintemaartensdijk@utwente.nl)

If you now feel like you would rather withdraw your consent of participation and usage of you data you can say so now.

Appendix B

(Virtual Reality) Neighbourhood Task

Before starting their task, participants are asked to read a scenario:

“In a few moments, you will dive into a virtual reality environment of a typical Dutch neighbourhood.

We want you to imagine you are in the market to buy a new house. You have been saving for a while and have finally decided to make this significant investment. Your task will be to walk around the neighbourhood and tell us what you see. After you have viewed the neighbourhood, we would like to know your impressions and preferences as well as which house you liked best.”

Appendix C

Willingness to Exhibit Dynamic Guardianship

When talking about securing one's home it is now possible to install items that create the illusion of someone being physically present when in reality nobody is home. Those items are Smart Home Devices (SHD) and can be for example, self-closing blinds, self-switching lights, and ring cameras that allow the owner to communicate with the person in front of it.

Please answer the following questions about these SHD:

1. Not using SHD is a serious threat to my safety
2. The longer you wait to install an SHD, the greater the likelihood of a burglary
3. If I do not install an SHD my home is at a higher risk of getting burgled while I am away.
4. I am partially responsible if my house gets burgle if I do not have an SHD installed
5. I can protect my own resources, such as free time and energy, by installing SHDs.
6. I can still protect myself from a burglary even if I do not install SHDs.
7. It is more convenient to rely on other preventative measures of burglary than SHDs.
8. It will save me money if I do not install an SHD.
9. I can avoid the hassles of installing an SHD.
10. I will save myself time by not installing a SHD
11. I will be less concerned about my privacy if I do not install an SHD
12. I will not become a victim of burglary if I install an SHD.
13. The surrounding neighbourhood will be safer after I installed an SHD.
14. The attractiveness of my home to a burglar will decline if I install an SHD.
15. I will be able to find a suitable SHD to install at home.
16. I have the skills to install an SHD if necessary
17. My friends will believe that I am protected against burglaries if I use and SHD.
18. My neighbours or people that live with me will not appreciate it if I install SHDs.

[Assessed on a 5- point Likert scale; Strongly disagree = 1; Strongly agree = 5]

Appendix D

Factor Analysis on Willingness to Exhibit Dynamic Guardianship

Table 4

Factor Analysis Results

Measure	item	*Factor 1*	*Factor 2*	*Factor 3*	*Factor 4*
Willingness	1	0.46	0.40	-0.27	0.42
	2	0.69	0.13		
	3	0.61		0.18	-0.14
	4	0.17	0.22		
	5		0.32	0.26	0.16
	6	0.62	0.15	0.12	0.18
	7	0.25	0.25	0.27	0.32
	8		0.32		0.55
	9			0.25	0.59
	10		-0.12	0.12	0.61
	11	0.14		0.26	0.14
	12	0.29	0.36		-0.14
	13	0.18	0.74		-0.15
	14	0.15	0.20	0.39	
	15			0.72	0.18
	16			0.49	
	17		0.64	0.17	
	18		0.19	0.56	0.13