Dusk or Dawn –

How Does the Perception of Guardianship of Burglars and Residents Differ in Neighbourhoods During Daytime Versus Nighttime?

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Abstract

It was found that the mere presence of a guardian can effectively deter potential burglars (Van Sintemaartensdijk et al., 2020). However, not much research has been done on guardianship and how it can be increased or even simulated. A new term is introduced namely dynamic guardianship which combines physical as well as symbolic guardianship to simulate guardianship. Therefore, this research investigates the impact of dynamic guardianship measures, specifically cameras and self-closing curtains, on perceived guardianship from the burglar's as well as the resident's perspective in residential neighbourhoods within VR during daytime as well as nighttime. Understanding how perceived guardianship, which refers to the sense of security derived from the presence of capable individuals deterring criminal activities, can be influenced is of great importance for developing effective crime prevention strategies, which consequently could strengthen community safety. A quantitative approach with an experimental design was used in which virtual reality videos were utilised to simulate neighbourhood scenarios. Participants were randomly assigned to different conditions regarding both perspective (Burglar's Perspective vs. Resident's Perspective) and dynamic guardianship measure (Camera vs. Self-closing curtains). Moreover, participants were asked to provide feedback on their perceptions of dynamic guardianship during different times of the day. Findings revealed no significant differences in perceived guardianship levels between daytime and nighttime scenarios incorporating security measures with dynamic guardianship aspects. However, there was no difference between perceived dynamic guardianship for the guardianship conditions (Camera vs. Self-closing curtains). Moreover, there were no significant differences in concern levels regarding burglary between neighbourhoods equipped with cameras and self-closing curtains. The study highlights the need for further research to address several important gaps in the existing literature.

How Does the Perception of Guardianship of Burglars and Residents Differ in Neighbourhoods During Daytime Versus Nighttime?

Crime, in its various forms, significantly impacts individuals and communities. Among different types of crimes, burglary stands out the most due to its low clearance rate as well as its long-term psychological impact on affected individuals (Wollinger et al., 2017). For instance, in Germany, the number of residential burglary cases increased between 2006 and 2015 by 57.52% (Wollinger et al., 2017). Despite the high incidence of burglaries, the police identification rate of suspects remained low at 15.2% in 2015 (Wollinger et al., 2017). Some negative effects of burglaries on residents include feelings of insecurity in their familiar surroundings, feelings of powerlessness or helplessness, stress, tension, anxiety, disturbances in sleep as well as nightmares (Wollinger et al., 2017). Moreover, burglaries often affect the person's sense of well-being in their home which often results in moving (Wollinger et al., 2017). Besides the psychological impacts burglary also impacts financial losses to a great extent (Bankiewicz & Papadouka, 2023). The financial damage caused by crime against property in the Netherlands in 2021 came to over 160 million euros (CBS, 2023). Therefore, it can be said that burglary largely affects individuals in various forms which all have negative long-term consequences leading to a lower quality of life overall.

A prime theory in explaining when burglaries happen and thus could be prevented is the routine activity theory (RAT) (Cohen & Felson, 1979; Miró, 2014). The RAT tries to explain how criminal activities occur which might help to draw conclusions about how to be able to prevent those (Cohen & Felson, 1979; Miró, 2014). According to the RAT, crime is defined as the result of a motivated offender, a suitable target, and the absence of a capable guardian (Reynald, 2009). The RAT explains further that if all those elements are given, the likelihood of a criminal event to occur is increased (Regaldo et al., 2022). Consequently, if one of those elements is absent the likelihood of crime decreases (Regaldo et al., 2022). Research has been done on all elements, however it is recognised that the presence of a

capable guardian takes on a crucial role in crime prevention (Firth et al., 2022; Marzbali et al., 2020; Moule & Powers, 2021; Van Sintemaartensdijk et al., 2020). However, this concept has not been widely studied yet despite its importance (Garofalo & Clark, 1992; Hollis-Peel et al., 2011). Therefore, it is of great importance to further study and explore what guardianship exactly entails, how guardianship impacts criminal behaviour and how we can develop effective strategies to enhance guardianship or give the illusion of enhanced guardianship.

Guardianship

Guardianship, as conceptualized in current research, focuses on the role of individuals in deterring criminal activities or behaviour (Hollis-Peel et al., 2011). Fundamentally, guardianship is defined as the perceived security derived from the presence of capable individuals within an environment who either actively or passively prevent crimes from occurring (Hollis-Peel et al., 2011). Studies on this topic support that increased levels of guardianship, so the perception of increased capable guardians, are related to decreased levels of crime (Moir et al., 2017). Moreover, it was found that the mere presence of a guardian can effectively deter potential burglars (Van Sintemaartensdijk et al., 2020). Therefore, guardianship raises the perceived chances of being caught and strengthens social cohesion, while diminishing the appeal of the neighbourhood for criminal activities (Van Sintemaartensdijk et al., 2020). Thus, guardians serve as a significant deterrent to residential burglary simply through their presence (Van Sintemaartensdijk et al., 2020).

In general, guardianship includes the presence of individuals who act as guardians. However, it is impossible to have present guardians, so physical guardianship, at all times (Van Sintemaartensdijk et al., 2022). Thus, the question arises of how we can give the illusion of guardianship even in the absence of individuals who could act as guardians. Symbolic guardianship might address this issue partly. Symbolic guardianship involves using signs or devices, like CCTV cameras or signs, to create the perception of surveillance (Van Sintemaartensdijk et al., 2022). This psychological deterrent makes potential offenders feel

they are being watched, reducing the likelihood of criminal activity (Van Sintemaartensdijk et al., 2022). Thus, even if the surveillance is not exerted by a real present guardian, the suggestion alone can be effective in preventing crime (Van Sintemaartensdijk et al., 2022).

Dynamic Guardianship

The new term we are going to introduce namely dynamic guardianship is an underexplored concept which combines physical as well as symbolic guardianship to enhance perceived guardianship even in the absence of a capable guardian, so when physical guardianship alone cannot be maintained. This combination is also due to recent technological developments. The perception of present guardians can be created by for example various security measures even though no individual is present who could act as a potential guardian. In short, the presence of a capable guardian is simulated without the burglar knowing that it is only simulated.

An example, which will be addressed in more detail later, might be automatic lights or self-closing curtains which simulate activity within a residence which in turn might increase the level of perceived guardianship (Montoya et al., 2014; Vandeviver & Bernasco, 2019). Another example could be security cameras which could additionally include motion-activated voice recordings. It is already established that CCTV cameras alone are an effective measure against burglary (Ashby, 2017; NZ Police, 2016). Through the use of CCTV potential burglars feel observed leading to a deterrence effect (Van Sintemaartensdijk et al., 2022). Furthermore, by enabling ongoing observation and the possibility of recorded evidence, security cameras provide residents with a sense of security (Brands et al., 2013). Residents can feel more at ease knowing that any criminal behaviour will be recorded by cameras, which might facilitate law enforcement's efforts to identify and apprehend offenders (Ashby, 2017; NZ Police, 2016). This capability not only deters criminal activity but also might increase residents' confidence in their safety. However, as mentioned before not much research has been done on this topic. It can be said that dynamic guardianship could be highly

effective if it works as intended which is why more research is needed to draw final conclusions.

Security Measures with Dynamic Guardianship Aspects

Research has shown that guardianship extends beyond the physical presence of individuals, with perceived observation alone deterring criminal activities (Van Sintemaartensdijk et al., 2022). This perceived observation can be facilitated by various security measures, as studies indicate that their presence predicts burglary rates (Ashby, 2017; Nee, 2015; NZ Police, 2016). Thus, identifying the most effective security measures with dynamic guardianship aspects might be of great importance in reducing burglary risk while enhancing perceived guardianship.

Surveillance systems or security cameras have become more prevalent in recent years (Vennam et al., 2021). These systems are nowadays widely used by government and private organizations, residential communities, and commercial and public locations to monitor activities in regard to safety and security (Vennam et al., 2021). Security cameras work by continuously monitoring and recording activities within their field of view (Cox et al., 2012; Wang, 2013). These recordings can then be reviewed if an incident occurs, providing valuable evidence for identifying and apprehending offenders (Ashby, 2017; NZ Police, 2016). More importantly, the presence of security cameras might have a significant deterrent effect on potential criminals.

For instance, the presence of CCTV cameras creates an environment where potential offenders are aware of the possibility that their actions are being monitored (Van Sintemaartensdijk et al., 2022). Moreover, this effect is given even if it is unclear whether someone is actively watching the footage at any given time (Van Sintemaartensdijk et al., 2022). This uncertainty can be enough to discourage criminal behaviour, as the risk of being observed and subsequently caught and arrested is heightened (Van Sintemaartensdijk et al., 2022). So even though no active guardian is present the perception of guardianship is exerted

by the camera as the possibility of being observed is still given. Therefore, it can be hypothesised that security measures portraying this observation effect, in this case, security cameras, might increase the perceived level of guardianship even when no physical guardian is present consequently displaying dynamic guardianship. This in turn might also reduce the concern level about burglary as perceived guardianship is increased with the use of cameras potentially leading to an overall feeling of security. This is also supported by the findings of Brands et al. (2013) who found that awareness of CCTV is linked to feeling safer in regard to criminal activities. It is suggested that cameras might have a greater effect on perceived safety than self-closing curtains since they provide the opportunity for recordings and, thus, definite evidence (Ashby, 2017; NZ Police, 2016). Moreover, cameras are more widely used and recognized as an effective security measure (Ashby, 2017; NZ Police, 2016; Vennam et al., 2021), which might contribute to a stronger sense of safety.

It is established that burglary is negatively affected by the perception of being observed (Van Sintemaartensdijk et al., 2022). This effect usually is given when residents are present who could act as possible guardians consequently increasing the level of perceived level of guardianship (Montoya et al., 2014; Vandeviver & Bernasco, 2019). The perceived presence of residents is usually indicated by sounds, lights, the presence of vehicles or movements within the residence (Montoya et al., 2014). Therefore, it can be said that security measures mimicking these factors might enhance the level of perceived guardianship consequently displaying dynamic guardianship.

An uncommon and new security measure that might possibly enhance the perceived level of guardianship through mimicking movements are self-closing curtains. These systems work by automatically closing in response to specific stimuli for example by changes in light or motion detection (Tan et al., 2019; Zaman et al., 2017). Therefore, these systems create movement within a residence, which might consequently simulate the actual presence of residents. The perception of activity inside a house might act as a deterrent to potential

burglars, who typically target unoccupied homes to minimize the risk of detection (Montoya et al., 2014; Vandeviver & Bernasco, 2019). By the use of self-closing curtains, the uncertainty regarding whether someone is at home increases which in turn might enhance perceived guardianship during the daytime. It is suggested that the guardianship effect is even stronger for self-closing during the daytime compared to nighttime as no or less activity is usually expected during daytime as residents are at work (Moir et al., 2017). Therefore, self-closing curtains might simulate activity during the daytime, potentially increasing perceived guardianship.

Moreover, self-closing curtains might add another layer of security by obstructing the view inside the residence. Potential burglars might have difficulties determining if someone is actually present or not, as the windows are blocked. Additionally, lights from inside are less visible which also serves as an indicator of the presence of residents (Montoya et al., 2014) which also might make it difficult to determine the presence of residents. This method draws upon the principle that human presence serves as a deterrent for criminal behaviour consequently, displaying dynamic guardianship aspects.

Guardianship: Day vs Night

The presence of individuals serves as a deterrent for criminal behaviour. This is also supported by research, as it is found that guardianship is perceived as higher during nighttime (Montoya et al., 2014). This is because burglars try to avoid residences that appear occupied to minimize the risk of being detected (Montoya et al., 2014; Vandeviver & Bernasco, 2019). Therefore, a possible target seems less attractive during the nighttime as most residents are at home (Montoya et al., 2014). Consequently, when residents leave their houses during the daytime to work or shop the perceived guardianship reduces (Moir et al., 2017).

A study found that during the daytime on weekdays, the perceived guardianship was the lowest (Moir et al., 2017). Compared to that the perceived guardianship was significantly increased during the nighttime as well as on weekends (Moir et al., 2017). Consequently, it is

of great interest to establish how perceived guardianship can be increased during the daytime while residents and neighbours who could serve as capable guardians are not present. Therefore, it is of interest to establish which security measures with dynamic guardianship aspects might enhance perceived dynamic guardianship in order to reduce possible crime-related activities during times of lower guardianship. Moreover, it is found that night-time burglary tends to be anticipated through access control (for example by fences) and target hardening measures (for example cameras) (Montoya et al., 2014). Therefore, if target-hardening devices are strategically implemented, they might help maintain a high level of perceived dynamic guardianship even during daytime when natural guardians are not present. Moreover, it is also important to find out under which circumstances dynamic guardianship does not work or is perceived as lower and if there might be differences between different times of the day.

The Present Study

This research aims to examine the perception of guardianship in residential neighbourhoods during both daytime and nighttime among residents and burglars. Understanding how different actors perceive and respond to security measures and risks might be essential for developing effective crime prevention strategies. Therefore, perspective-taking is utilized in this study. This method, widely employed across various fields, involves envisioning situations from different viewpoints (Ku et al., 2010). Previous research has shown that perspective-taking increases understanding of others emotions and actions (Ames et al., 2008; Maister et al., 2015; McAuliffe et al., 2018). Therefore, incorporating the perspectives of specific individuals, like burglars, might deepen understanding of their motivations and behaviour (Ames et al., 2008; Maister et al., 2015; McAuliffe et al., 2018). Thus, this approach might allow to uncover psychological factors influencing criminal behaviour (Burt & Simons, 2013; Cromwell et al., 1990; Schmideberg, 1947), enabling the development of comprehensive theories and effective prevention strategies.

The goal of this study is to establish if there is a significant difference between perceived dynamic guardianship, as indicated by the presence of cameras and self-closing curtains, for burglars and residents during different daytimes. To achieve this goal an online study was conducted. Participants were randomly assigned to adopt either the perspective of a resident or a burglar while watching videos. The presented videos incorporated simulated neighbourhood scenarios within virtual reality, displaying different security measures (Cameras and Self-closing curtains), during both daytime and nighttime. Moreover, participants completed questionnaires assessing their perceptions of guardianship for both daytimes, as well as manipulation checks to ensure they accurately perceived the security measures presented in the scenarios. Additionally, video engagement, personality traits, and self-reported delinquency were measured to provide further insights into participants' responses.

This research aims to test the following hypotheses:

H1: Individuals taking the perspective of Burglars will perceive no difference in perceived dynamic guardianship during nighttime compared to daytime due to security measures incorporating dynamic guardianship aspects.

H2: Individuals taking the perspectives of Burglars will perceive higher levels of dynamic guardianship in neighbourhoods including self-closing curtains during daytime compared to nighttime.

H3: Individuals taking the perspective of Residents will express lower levels of concern about burglary risks in neighbourhoods including Cameras compared to Self-closing curtains.

Method

Design

The conducted study was a quantitative study in which an experimental research design with six conditions was adopted. The study employed a repeated measure between-within design. Participants were randomly assigned to take either a burglar perspective or resident perspective. Moreover, participants were randomly assigned to receive either the camera condition or self-closing curtains. Those conditions were presented during daytime as well as nighttime. Which time of the day was presented first was also randomised.

Participants

Non-probability sampling was used as the sampling approach to recruit participants for each of the conditions. Therefore, the most accessible participants were selected also known as convenience sampling (Etikan et al., 2016). The subject pool “SONA” from the University of Twente in the Netherlands was used to recruit participants and participants received 0.25 SONA credit points in exchange for their participation in the online study. Additionally, "Reddit" was utilized to attract participants. Therefore, the researcher and other individuals who conducted research studies traded surveys. Thus, after participating in this study, the participants received a participant for their own study as an incentive. Inclusion criteria were being at least 18 years of age and possessing adequate English skills.

In total 172 participants took part in the study. 64 participants were excluded because of incomplete responses. After that, 108 participants were included in further analysis. The mean age of the participants was 30.13 years. The gender distribution was predominantly female, with 82 participants (75.9%), followed by 24 male participants (22.2%), and 2 non-binary participants (1.85%). In terms of nationality, the sample included 27 Germans (25%), 4 Dutch (3.7%), 37 Americans (34.3%), and 40 participants from other nationalities (37%). Regarding education levels, 27 participants (25%) had a high-school diploma, 59 participants (54.6%) had a Bachelor’s degree, 13 participants (12%) had a Master’s degree, and 9

participants (8.33%) reported other forms of education. All background characteristics of each condition as well as the overall sample can be found in Table 1 in Appendix H.

Materials

Videos were utilized to display the different conditions within a virtual neighbourhood. Those videos were recordings of a virtual reality environment that was already available and created through the programme “Unity”. The neighbourhood was recorded mimicking daytime (Figure 1) as well as nighttime. To create the videos the researcher recorded a run-through of the whole neighbourhood using the Oculus Quest 2 VR head-mounted display with a stereoscopic view as well as game controllers that allowed to navigate through the environment. Additionally, the recordings were done using the software OBS and the length of the videos varied between two and three minutes. R-Studio Version 4.2.0, an integrated development environment for R, was used to analyse the data.

Virtual Neighbourhood

The virtual neighbourhood displayed a suburban residential area characterized by a tree-lined street and well-maintained houses. The environment included a single street lined with five middle-class houses built with brick, each with large windows and pitched roofs. Some houses had garages with cars parked in front of the garage. Other houses had cars parked in front of the house on the street with a variety of colours and types reflecting a middle-class community. A trash can was visible on the sidewalk near one of the houses. The street was wide, made of asphalt, and shaded by trees. Concrete sidewalks ran parallel to the street on both sides, bordered by grassy areas, hedges, and shrubs, contributing to the well-kept appearance of the neighbourhood. The overall environment appeared peaceful and typical of a quiet suburban area, with no visible people or signs of activity, suggesting a calm residential neighbourhood. Two houses each in the neighbourhood displayed security measures such as cameras (Figures 2a and 2b) or self-closing curtains (Figure 3) depending on the condition.

Figure 1

Outlook of the Street during Daytime

Note. Only images of the daytime of the environment are included because the nighttime images were of poor quality and difficult to interpret. Unlike the VR environment, which provided live and interactive features the static nighttime images failed to accurately represent the conditions as well as the whole environment.

Figure 2a

Houses equipped with Cameras (Day)

Figure 2b

Houses equipped with Cameras (Day)

Figure 3

Houses equipped with self-closing curtains (Day)

Before *After*

Manipulations

In one condition participants were provided with a video that displayed a virtual neighbourhood incorporating two houses equipped with cameras therefore displaying dynamic guardianship features. This condition was provided in two versions namely during the daytime as well as the nighttime. Which time of the day was received first was randomised. In the other condition, participants were presented with the same neighbourhood displayed during daytime as well as nighttime however this condition included two houses

with automatic self-closing curtains instead of cameras to display dynamic guardianship features.

Questionnaires

Manipulation Check. To test whether participants perceived the presented security measures a manipulation check was presented after each video which included the question: “What security measures have you seen?”. Therefore, participants were free to write down what they had seen within the videos displaying the virtual environment. When checking the responses manually several participants had indicated the presented security measure correctly. However, few participants left the response field empty or included a broad explanation of the overall environment. Some had indicated that they perceived locked doors as security measures. The data was not analysed numerically since the focus was on confirming general understanding rather than statistical analysis of the responses.

Dynamic Guardianship. The dynamic guardianship scale was established by our team during an internship at the University of Twente within the Conflict, Risk and Safety department. We created the scale after thoroughly reviewing numerous articles on the topic as well as related ones. This process included gathering initial feedback from different professors at the University to refine the scale. The feedback helped us ensure the scale's validity and reliability, leading to a comprehensive tool for assessing dynamic guardianship perceptions. The scale consists of two distinctive parts, the burglar perspective as well as the resident perspective, which are discussed below in more detail. Answers were given on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). The average mean of the total sample during the daytime was $M = 3.52$ with a standard deviation of $SD = 0.69$. The average mean during the nighttime was $M = 3.59$ with a standard deviation of $SD = 0.68$. The full scale can be found in Appendix C.

Burglar Perspective. One part of the scale assessed perceived activity level, decision-making processes, and risk perception from the burglar's perspective. These constructs were

selected based on literature emphasizing their significance in understanding how burglars perceive dynamic guardianship. Thus, 19 questions were incorporated in this part of the scale. The reliability analysis concluded an overall Cronbach's alpha of $\alpha = 0.92$. This indicates great internal consistency of the scale measuring guardianship from the burglar's perspective. The Bartlett test concluded $\chi^2(703) = 1546.69$, $p < .001$. Sampling adequacy was moderate (KMO = 0.58). The average mean during the daytime was $M = 4.00$ with a standard deviation of $SD = 0.53$. The average mean during the nighttime was $M = 4.09$ with a standard deviation of $SD = 0.42$.

Resident Perspective. The second part of the scale namely the resident perspective part consists of 20 questions which are based on the protection motivation theory (PMT). The PMT explains that an individual's motivation to protect themselves from potential threats is influenced by their perception of the severity and vulnerability of the threat, as well as their belief in their ability to respond effectively (self-efficacy) and the perceived costs and benefits of taking action (Norman et al., 2015). Therefore, the scale incorporates these aspects with measuring the concepts: severity, vulnerability, intrinsic reward, extrinsic reward, self-efficacy, response cost and response efficacy in regard to guardianship. Items 1 – 9 and 14 - 16 of the scale measured concern levels regarding burglary as they involved items questioning severity as well as response efficacy. Moreover, the items were included based on the phrasing of the questions which intended to measure and address concern levels. The reliability analysis concluded an overall Cronbach's alpha of $\alpha = 0.92$. This indicates great internal consistency of the scale measuring guardianship from the resident's perspective. The Bartlett test concluded $\chi^2(780) = 1928.34$, $p < .001$. Sampling adequacy was moderate (KMO = 0.52). The average mean during the daytime was $M = 3.07$ with a standard deviation of $SD = 0.48$. The average mean during the nighttime was $M = 3.14$ with a standard deviation of $SD = 0.55$.

Video Engagement Scale. To measure the viewer's engagement and perceived realism of the presented videos the video engagement scale by Visser et al. (2016) was adopted (as presented by Lehmann et al. (2022)). The scale incorporates 15 items measuring four subscales namely emotions, empathy, identity, and going into a narrative world (Visser et al., 2016). Answers were given on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). The scale was adjusted to fit the wording and conditions of the current study and three items were excluded since the items were not relevant for the utilised videos. Therefore, the scale then consisted of 12 items in total (Appendix D). The reliability analysis concluded an overall Cronbach's alpha of $\alpha = 0.89$. The mean of the total sample was $M = 3.31$ with a standard deviation of $SD = 0.78$.

HEXACO-60. The scale constructed by Ashton and Lee (2009) consists of 60 items and was used to assess six personality facets including: openness to experience (α = .52), conscientiousness (α = .77), emotionality (α = .81), agreeableness (α = .68), honesty-humility (α = .59) and extraversion (α = .81). Each personality facet was measured by 10 items each. Answers were given on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). All items can be found in Appendix E. The mean and standard deviation for openness to experience came to $M = 3.30$ and $SD = 1.32$, conscientiousness $M = 3.40$ and $SD = 1.20$, emotionality $M = 3.21$ with $SD = 1.17$, agreeableness $M = 2.97$ with $SD = 1.17$, honesty-humility $M = 3.26$ with $SD = 1.30$ and extraversion $M = 2.99$ with $SD = 1.12$. Although the scale was initially considered for inclusion in the study, it exceeded the scope of the present research objectives which is why the outcome was not relevant or analysed further. However, it might be used for future research.

Self-reported delinquency. To measure delinquency the self-reported delinquency scale was adopted (Svensson et al. 2013). This was done to identify individuals who might have experiences with delinquent behaviour which might result in different outcomes compared to individuals without such experiences. The scale consists of 22 items (Appendix

F). Answers for this scale were ranging from “never” (1) to “more than ten times” (5). The average mean was $M = 1.06$ with a standard deviation of $SD = 0.33$. No individual needed to be excluded as no participant scored high on this scale and therefore displayed delinquent behaviour.

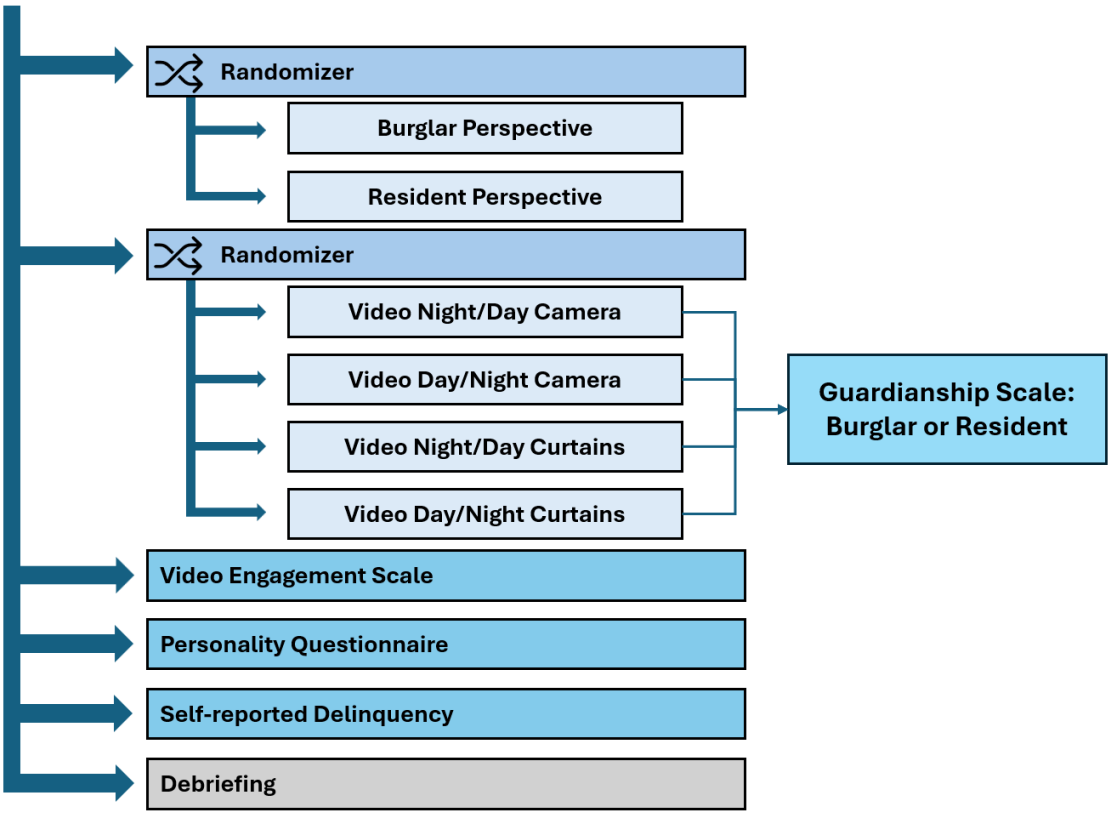
Procedure

Participants were contacted and received the link to the online study. Next, the informed consent form was provided which included information about the confidentiality and anonymity of the study (Appendix A). After that, demographics were measured to understand the characteristics of the sample population (age, nationality, educational background). Then participants were automatically and randomly assigned to either receive the burglar or the resident perspective. Thus, a short text was displayed informing them about the perspective they had to take on while watching the videos (Appendix B). Following, the first video was provided which displayed a simulated neighbourhood scenario during either daytime or nighttime. Which time the participant saw first was randomly allocated as well as the displayed condition. The video displayed residential properties with different dynamic guardianship indicators according to the condition. Therefore, one condition was equipped with cameras and the other with automatic self-closing curtains. Following the video, participants completed a manipulation check which was included after each video and a questionnaire assessing their perceptions of guardianship. For the scale, participants received either the resident perspective part of the scale or the burglar perspective depending on the perspective they got assigned to at the beginning of the study. Next, participants were provided with the second video displaying the condition they got allocated to (camera or self-closing curtains), either during daytime or nighttime, depending on what they did not see previously. Following the second video, participants completed a second manipulation check and questionnaire mirroring the first one, assessing their perceptions of guardianship in the second simulated neighbourhood scenario depending on their perspective received. Thus,

participants received the part of the guardianship scale assessing their allocated perspective. Additionally, participants were presented with the video engagement scale, a personality questionnaire, and lastly, a questionnaire measuring self-reported delinquency. After finishing the questionnaires all participants were provided with a debriefing form (Appendix G) which included information about the study's objectives and any potential manipulations. Moreover, the form assured of the confidentiality of the responses and provided contact information of the researchers for any further inquiries. With that, the study was completed. The visualised main procedure excluding the consent form as well as demographic questions can be found in Figure 4. The study was given ethical approval by the ethics committee of the University of Twente.

Figure 4

Visualised Main Procedure



Note. Participants were randomly assigned to receive either the day or night version of the videos first. However, both were presented to the participants.

Data Analysis

R-Studio version 4.4.0 with the packages: dplyr, lme4, matrix, tidyverse, rmisc, broom, car, rstatix, readxl, afex and effectsize were utilised to analyse the data. The data was cleaned by removing individuals who indicated they wished to withdraw from the study as well as any incomplete responses. Descriptive statistics were then analysed to determine the demographic characteristics of each condition. To test the engagement for the videos presented within the study the outcome of the video engagement scale was analysed. After that, a two-way ANOVA was conducted to examine if there was a difference between all conditions (Resident, Burglar, Camera, Curtains) on engagement scores.

The perspective condition (Burglar vs. Resident), as well as the measure condition (Self-closing curtains vs. Camera), are between-subjects factors, as participants are assigned to one condition or the other. Next, the time of the day (Daytime vs. Nighttime) is a within-subjects factor since each participant experienced both levels of this factor. The first hypothesis was tested using a paired sample t-test to compare perceived dynamic guardianship levels between daytime and nighttime for the burglar's perspective. The second hypothesis used a paired sample t-test to compare dynamic guardianship perceptions from the burglar's perspective between daytime and nighttime scenarios involving self-closing curtains. The third hypothesis was tested using another t-test to assess differences in concern levels for the resident perspective between neighbourhoods equipped with cameras and self-closing curtains.

Results

Preliminary Analysis

A two-way ANOVA was conducted to examine the effects of condition (Camera vs. Self-closing curtains) and perspective (Resident vs. Burglar) on the engagement scores (Table 2). The results of the two-way ANOVA can be found in Table 3. No significant difference was found.

Table 2

Video Engagement Scale Mean and SD

	Camera	Curtains	Burglar	Resident	Total Sample
Mean	3.36	3.28	3.22	3.40	3.31
SD	0.71	0.86	0.85	0.72	0.78

Table 3

Two-way ANOVA results for Video Engagement Scale

	Df	F Value	*p*
Perspective Condition	1,104	1.47	0.23
Measure Condition	1,104	0.41	0.53
Perspective Condition:Measure Condition	1,104	2.82	0.096

Note. "Perspective Condition" refers to the perspective taken by participants (Resident or Burglar). "Measure Condition" refers to the conditions which were presented in the videos (Camera or Self-closing curtains).

Hypothesis Testing

To get an overview of the data, descriptive statistics were analysed. Table 4 presents the mean and standard deviation of perceived dynamic guardianship levels for both burglars

and residents across different conditions (Camera and Self-closing curtains) and times of day (Day and Night).

Table 4

Guardianship Mean Score and Std. Deviation of all Variables and Conditions

Time of Day		Burglar			Resident			Total Sample
		Camera	Curtains	Total	Camera	Curtains	Total	
Day								
	M	4.03	3.97	4.00	3.21	2.99	3.07	3.52
	SD	1.08	1.01	0.53	1.05	1.11	0.48	0.69
Night								
	M	4.09	4.07	4.08	3.33	3.01	3.14	3.59
	SD	1.09	1.08	0.42	1.11	1.11	0.55	0.68

H1: "Individuals taking the perspective of Burglars will perceive no difference in perceived dynamic guardianship during nighttime compared to daytime due to security measures incorporating dynamic guardianship aspects"

The results concluded a mean of $M = 4.00$ and $SD = 0.53$ during daytime and $M = 4.08$ and $SD = 0.42$ during nighttime. To test for a significant difference a paired sample t-test was exerted, $t(51) = -1.44$, $p = 0.15$. Therefore no significant difference was found between perceived dynamic guardianship levels during daytime compared to nighttime for burglars. Consequently, the hypothesis was accepted.

Additionally analysis. Additionally, the guardianship level for individuals taking the perspective of residents was analysed for exploratory purposes. The means and standard

deviations can be found in Table 4. To test for a significant difference a paired sample t-test was exerted, $t(55) = -1.52$, $p = 0.13$. Therefore no significant difference was found between perceived dynamic guardianship levels during daytime compared to nighttime for residents.

H2: "Individuals taking the perspectives of Burglars will perceive higher levels of dynamic guardianship in neighbourhoods including self-closing curtains during daytime compared to nighttime"

The means and standard deviations can be found in Table 4. The paired sample t-test concluded that there was no significant difference found ($t(23) = -1.13$, $p = 0.26$). Therefore, this hypothesis was rejected. A repeated measure ANOVA was conducted to test if there is a significant difference across both the conditions during daytime as well as nighttime. Table 5 shows the results of the repeated measure ANOVA analysis. No significant effect was found.

Table 5

Repeated Measure ANOVA Results for Burglar Dynamic Guardianship Perception Based on Condition (Camera and Self-closing curtains) and Time of Day (Nighttime and Daytime)

	Df	F Value	*p*	η^2 (partial)
Measure Condition	1, 50	0.07	0.78	0.00
Time of Day	1, 50	2.10	0.15	0.04
Measure Condition : Time of Day	1, 50	0.12	0.72	0.00

Note. "Measure Condition" refers to the conditions which were presented in the videos (Camera or Self-closing curtains).

Additional Analysis. Additionally, for exploratory purposes, the perspective of the residents was also analysed in regard to differences in perceived dynamic guardianship levels between day and nighttime for both measures namely camera and self-closing curtains. The means and standard deviations can be found in Table 4. The results of the repeated measure ANOVA (Table 6) suggest that there is a significant main effect of the measure condition

(Camera vs Self-closing curtains) indicating that there are differences in perceived dynamic guardianship levels between the two measures. Therefore, participants' perceptions of guardianship vary depending on whether they were presented with a scenario involving cameras or self-closing curtains. In conclusion, participants taking the resident perspective perceived higher levels of dynamic guardianship when presented with the camera condition.

Table 6

ANOVA Results for Resident Dynamic Guardianship Perception Based on Condition (Camera and Self-closing curtains) and Time of Day (Nighttime and Daytime)

	Df	F value	*p*	η^2 (partial)
Measure Condition	1, 54	4.93	0.03	0.08
Time of Day	1, 54	2.28	0.13	0.04
Measure Condition : Time of Day	1, 54	1.56	0.21	0.03

Note. "Measure Condition" refers to the conditions which were presented in the videos (Camera or Self-closing curtains).

H3: "Individuals taking the perspective of Residents will express lower levels of concern about burglary risks in neighbourhoods including Cameras compared to Self-closing curtains"

The mean results as well as the standard deviations can be found in Table 7. The conditions self-closing curtains and cameras were a between factor. A score of 1 would indicate a low concern level while 5 would indicate a high concern level. To test for a statistically significant difference a t-test was done. The results conclude that there is no statistically significant difference in the average concern scores between the camera and self-closing curtains conditions ($t(52.24) = 1.67$, $p = 0.10$). Therefore, this hypothesis was rejected.

Table 7

Concern Mean Score and Std. Deviation of the Resident Perspective with all Conditions

Time of Day		Resident	
		Camera	Curtains
Day			
	M	3.12	2.89
	SD	0.64	0.64
Night			
	M	3.26	2.9
	SD	0.73	0.67
Total			
	M	3.18	2.89
	SD	0.66	0.63

Additional Analysis. Moreover, for exploratory purposes it was also tested for differences in concern levels between the conditions (Self-closing curtains and Cameras) and the times of day (Daytime and Nighttime). To clarify, the concern score for both conditions (Self-closing curtains and Camera) was established during both times of the day and compared. The results can be found in Table 7. The results of the repeated measure ANOVA (Table 8) indicate no significant effects.

Table 8

Repeated Measure ANOVA Results Concern Levels by Measure Condition (Self-closing curtains and Camera) and Time of Day

	Df	F value	*p*	η^2 (partial)
Measure Condition	1, 54	2.80	0.09	0.05
Time of Day	1, 54	2.04	0.15	0.04
Measure Condition:Time of Day	1, 54	1.59	0.21	0.03

Note. "Measure Condition" refers to the conditions which were presented in the videos (Camera or Self-closing curtains) and these were between subjects. Time of Day as well as Measure Condition:Time of Day were within subjects.

Discussion

This study aimed to explore the impact of security measures incorporating dynamic guardianship aspects, namely cameras and self-closing curtains, on perceived guardianship from both burglars' and residents' perspectives in residential neighbourhoods during daytime and nighttime. The primary focus was to understand how perceived guardianship can be influenced by certain measures in order to increase perceived guardianship in the absence of a guardian. The study found that the perceived guardianship levels between daytime and nighttime scenarios incorporating dynamic guardianship measures were very similar for individuals taking the burglar perspective. Therefore, the perceived guardianship remained consistent across different times of the day incorporating the additional security measures. Moreover, individuals taking the perspectives of burglars did not perceive higher levels of dynamic guardianship in neighbourhoods including self-closing curtains during daytime compared to nighttime, indicating that the time of day did not affect the perceived effectiveness of self-closing curtains as a security measure. There was no significant difference in concern levels of individuals taking the perspective of residents regarding burglary between neighbourhoods equipped with cameras compared to self-closing curtains leading to the conclusion that both security measures did not differ in the effect on perceived concern regarding burglary.

Dynamic Guardianship and Times of the Day

As predicted, perceived dynamic guardianship remained stable across both daytime and nighttime from the perspective of potential burglars. This suggests that the security measures incorporating dynamic guardianship aspects were effective stabilising the perceived dynamic guardianship through different times of the day. Research has found that perceived guardianship is higher during nighttime due to most individuals being at home who serve as natural guardians and display levels of activity (Moir et al., 2017; Montoya et al., 2014). Compared to that, guardianship is lower during the daytime due to absent individuals and

lower activity (Moir et al., 2017). It can be suggested that due to the incorporated security measures, guardianship might be simulated during daytime consequently decreasing the attractiveness of a potential target during daytime due to increased perceived dynamic guardianship.

The effectiveness of dynamic guardianship measures in the current study might highlight their potential ability to maintain stable perceptions about guardianship throughout the day. However, it is important to address whether the stability is primarily related to the dynamic guardianship measures themselves, or if other factors are also affecting its impact.

For example, there were the same number of cars parked during the daytime as during the nighttime in the used virtual environment. This might have indicated no noticeable difference in the perceived neighbourhood activity. In contrast, in real-world environments, there are usually fewer parked vehicles during the daytime due to residents leaving their homes for work (Montoya et al., 2014; Vandeviver & Bernasco, 2019), suggesting that fewer people are at home and possibly lowering the perceived level of guardianship. Compared to that, more vehicles are expected at nighttime since most residents are at home during this time (Montoya et al., 2014; Vandeviver & Bernasco, 2019). This variability could undermine the stability of guardianship perceptions. Moreover, it is found by Van Sintemaartensdijk et al. (2020) that the simple presence of informal guardians already discourages burglars. Therefore, the presence of parked cars might have contributed to a perception of guardianship leading to the found results. Therefore, it is crucial to explore if factors like changes in environmental cues, such as the presence of parked cars, might have influenced the results. Thus, it is important to research if other variables might have resulted in the found effect.

The findings of the study also support the findings of other studies which suggest that burglars assess targets based on perceived guardianship overall rather than only the actual presence of individuals (Montoya et al., 2014; Vandeviver & Bernasco, 2019; Van Sintemaartensdijk et al., 2022). Therefore, not only the actual presence of individuals who

serve as guardians is important but also aspects that serve as indicators for guardians or give rise to the speculation that one is being observed. This is also supported by the findings of Van Sintemaartensdijk et al. (2022) who recognised that the concept of guardianship extends beyond the physical presence of individuals who could serve as guardians. Therefore, the perceived observation effect of guardians, facilitated by security measures like cameras, can deter criminal activities by increasing the perceived risk of detection (Van Sintemaartensdijk et al., 2022). This effect persists even when it is unclear whether someone is actively monitoring the footage, emphasizing the psychological deterrent of being potentially observed.

The presence of security measures including dynamic guardianship aspects might stabilise the dynamic guardianship perception both during daytime and nighttime possibly leading to a decrease of target attractiveness due to higher perceived guardianship. This suggests that dynamic guardianship measures, namely cameras and self-closing curtains, could effectively reduce the risk of burglary by maintaining consistent levels of perceived security throughout the day. However, it is important to consider whether this effect can be sustained over time. Several factors such as the neighbourhood's overall perceived safety, residents' familiarity with security measures, and ongoing maintenance and visibility of these measures could influence their long-term effectiveness. For example, perceived guardianship may be influenced by the neighbourhood's overall perceived safety. Specifically, in neighbourhoods with high perceived safety, residents may feel more secure regardless of the time of day or the presence of dynamic guardianship measures. Conversely, in areas with lower perceived safety, the effectiveness of these measures might fluctuate more significantly, as residents rely more heavily on visible security measures to feel safe. Thus, it can be said that the present study supports that security measures, irrespective of the time of day, create an environment that deters potential offenders, however, more research needs to be done in order to test whether this effect is influenced over time.

Contrary to expectations, the effectiveness of self-closing curtains on perceived guardianship showed no difference based on time of day for the burglars' perspective. This might suggest that self-closing curtains, regardless of the time of day, effectively convey the presence of potential guardians, resulting in a consistent feeling of guardianship. Moreover, since it is usually expected that individuals are present during the nighttime (Montoya et al., 2014), the perceived guardianship level is already high during the nighttime. Therefore, compared to the daytime, it is likely that the presence of self-closing curtains creates a baseline level of perceived guardianship that does not fluctuate significantly with time. This suggests that self-closing curtains might effectively neutralize the typically lower perceived guardianship during daytime when actual human presence is less. Consequently, burglars might perceive neighbourhoods with self-closing curtains as consistently protected or occupied. This is also supported by studies that found that burglars typically avoid occupied houses to reduce the possibility of being detected (Montoya et al., 2014; Vandeviver & Bernasco, 2019). Signs of occupation are usually indicated by sounds or movements within the residence (Montoya et al., 2014) which are then also portrayed by self-closing curtains. Therefore, the created movements from the self-closing curtains might simulate the presence of guardians hence increasing perceived dynamic guardianship overall.

However, the sustainability of this deterrent effect could once again be affected over time. Burglars might become familiar with the patterns of movement created by self-closing curtains, potentially recognizing that the appearance of activity does not always indicate actual occupancy. This familiarity could diminish the perceived risk of detection and reduce the effectiveness of self-closing curtains as a deterrent. To maintain the effectiveness of self-closing curtains over the long term, it may be necessary to consider strategies that enhance their authenticity and unpredictability. This could involve varying the timing and frequency of curtain movements, integrating them with other security measures, or combining them with technologies that simulate more realistic patterns of occupancy.

Concern and Measures with Dynamic Guardianship Aspects

Unexpectedly, the concern levels about burglary did not differ between the self-closing curtains condition and the camera condition for individuals taking the perspective of residents. It was hypothesized that cameras might have a greater effect on concern levels compared to self-closing curtains since cameras are a commonly used security measure (Shimanoe & Amemiya, 2019). However, the outcome of the current study could be due to the established research which states that camera systems do not necessarily reduce fear or concerns in regard to crime (Lorenc et al., 2013). According to Lorenc et al. (2013), while cameras can be beneficial in reducing real crime rates in certain conditions, their impact on perceived safety is ambiguous. The installation of cameras might even raise citizens' awareness of the likelihood of crime (Lorenc et al., 2013), consequently sustaining or even raising concerns rather than reducing them. Therefore, the presence of cameras might serve as a constant reminder to citizens of the possibility of criminal activities. This enhanced awareness might then even result in increased anxiety rather than reassurance. Allard (2016) found that the effectiveness of cameras in making individuals feel safer varied substantially depending on their position, visibility, and the perceived reliability of individuals observing the established footage. Another reason could be that camera surveillance is quite common in modern environments (Vennam et al., 2021). Therefore, it might be hypothesized that the constant presence might lead to a possible normalization (Scalia, 2013). Residents might not notice a substantial difference between environments with and without cameras. As a result, their level of concern about burglary may not vary considerably across settings.

Moreover, the concern level for the self-closing curtains condition was also not really high but slightly lower compared to the camera condition. The slightly lower mean of concern levels for self-closing curtains compared to cameras might indicate a more multifaced and complex perception of security measures. Self-closing curtains, while less common, may be seen as providing more direct privacy and personal control over one's surroundings.

Moreover, self-closing curtains might allow residents to actively manage their privacy, enhancing feelings of safety and reducing concern about potential burglaries. The instant physical barrier which is provided might offer individuals a concrete sense of security and privacy, potentially reducing burglary concerns more effectively than cameras. Unlike cameras, which serve as a constant reminder of surveillance and potential crime, self-closing curtains might enable residents to block outside visibility and deter potential intruders proactively. This underscores the importance of investigating various guardianship strategies and their distinct effects on residents' sense of security.

Important to discuss is that the concern level in general was not that high. This could be related to a variety of variables, including the neighbourhood’s overall safety, previous burglary experiences, and the perceived effectiveness of existing security measures. In situations where residents may already feel safe, the small added advantages of additional security measures such as cameras or self-closing curtains may not greatly affect their overall concern about burglary. This might imply that perceptions of security measures are influenced not only by their direct effect on safety but also by larger contextual elements.

Limitations and Strengths

During the course of the study, limitations were identified which should be taken into consideration for future research to enhance the validity and applicability of findings. First, the study did not include a control condition neighbourhood in which no security measures were displayed. This lack of a control condition might limit the ability to determine the specific influence of security measures on perceived guardianship. Therefore, without a control condition, it becomes challenging to isolate and attribute changes in perceived guardianship to the presence of security measures alone. The lack of a control group could make it difficult to determine the actual effect of security measures and distinguish them from other external factors which might have impacted participants' perceptions. Control conditions are essential to reduce the impact of unwanted variables and provide a clear comparison point

(Mohr et al., 2009). This then can enhance the robustness of the study's conclusions (Mohr et al., 2009) which is why it is recommended for future research.

Another limitation emerges from the authenticity of the burglar's perspective. Since no participants with actual burglar experience were used, the study is based on theoretical perspectives. Thus, the behaviour and opinions may differ from the actual motivations and behaviours of burglars in real-world circumstances. While theoretical models might be informative, they cannot fully capture the complexity and diversity of human behaviour, especially in criminal circumstances. As a result, the findings may lack validity since they do not fully represent the complex decision-making processes of actual burglars. This lack of an authentic perspective may impair the study's ability to generalize its findings to real-world settings consequently reducing the applicability of its conclusions. Therefore, this limitation should be addressed in future research.

Additionally, the study's use of videos instead of virtual reality technology could also pose several limitations. While videos were used to reach a larger and more diverse participant sample, they may not fully reflect the immersive and interactive nature of actual virtual reality settings (Long et al., 2023; Shaner & Donmoyer, 2022). Videos may lack the depth, spatial awareness, and interactive components that virtual reality offers, resulting in a less compelling and realistic experience for participants (Long et al., 2023; Shaner & Donmoyer, 2022). As a result, participants may view the video-based simulations as less realistic, which could influence their responses and perceptions. This constraint may have an impact on the validity of the study's findings, as the simulation channel might influence how participants engage with and interpret the scenarios given. Therefore, it is recommended to take this into account for further research.

Despite these limitations, the study also entails strengths that should be acknowledged as well. As a result of the study's online format, a larger sample size was accomplished by reaching a large number of participants from diverse backgrounds simultaneously. Moreover,

since the survey was conducted online and accessible through a link the survey is suggested to have been easy to complete for participants. Moreover, videos were utilized instead of VR technology to facilitate online participation and consequently reach a wider audience. Unlike VR experiences, which may induce cybersickness (Chandra et al., 2022) and require in-person interaction, videos provide a more accessible and user-friendly format for participants. This approach ensured that individuals could engage with the study remotely without experiencing discomfort or technical barriers associated with VR technology.

Conclusion

This study is one of the first efforts to explore the concept of dynamic guardianship in residential neighbourhoods and its impact on perceived guardianship from both burglars' and residents' perspectives during differing times of the day. Dynamic guardianship, which is displayed by cameras and self-closing curtains, aims to simulate the presence of guardians through technological means, thereby enhancing the perception of guardianship even in the absence of actual human guardians. Findings suggest that incorporating dynamic guardianship measures within a neighbourhood might stabilise perceived dynamic guardianship during different times of the day consequently decreasing target attractiveness. However, a clear difference between the effectiveness of the different measures could not be established. Moreover, it was found that the concern level regarding burglary was rather low in conditions displaying security measures with dynamic guardianship aspects. This research highlights the importance of further investigating dynamic guardianship, particularly to understand the long-term sustainability of its deterrent effects and its interaction with other environmental and situational factors. By being one of the first studies in this domain, it lays the groundwork for future exploration and refinement of security measures that leverage technological advancements to enhance residential safety.

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Appendix A

Consent Form

Dear participant,

thank you for participating in this study, which is part of my Master's Thesis!

This study aims to examine the perception of Guardianship.

Short videos, as well as questionnaires, will be displayed and completing the study will take approximately 30-45 minutes.

The participation is completely voluntary and you can withdraw from the study at any given time, without stating a reason. All of the answers remain anonymous and will be treated confidentially. The data will only be used for research purposes. If you feel uncomfortable you can stop participating at any moment without giving a reason. Furthermore, if you want your data to get removed from the study, you can also contact the researcher in order to get the data deleted. Participants who indicate they are interested can receive a summary of the research results. This research has been approved by the Ethics Board of BMS.

Contact: X (taken out due to privacy rules)

Contact of the Supervisor of this study: X (taken out due to privacy rules)

Please answer the following question:

I agree that I read and understood the information. I am aware that my answers are used for research purposes, that I can withdraw at any moment, and that my answers remain anonymous.

Yes, I agree

No, I do not agree

Appendix B

Perspective Information

Burglar:

Next, you will be presented with two Videos in total. After each Video a questionnaire will follow.
As you watch the videos, we kindly ask you to imagine yourself in the role of a burglar, considering potential targets and assessing security measures within the neighbourhood. Your task is to observe the surroundings from the perspective of someone planning a burglary and to consider how certain factors may influence your target choice.

Your perspective while watching the Videos: Burglar!

Resident:

Next, you will be presented with two Videos in total. After each Video a questionnaire will follow.
As you watch the videos, we kindly ask you to imagine yourself as a resident of the neighbourhood and assess displayed security measures. Your task is to observe the surroundings from the perspective of someone living in the neighbourhood and to consider how certain factors may contribute to your perception of security.

Your perspective while watching the Videos: Resident!

Appendix C

Guardianship Scale

All Questions are answered on a 5-point Likert Scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

Strongly disagree =1

Somewhat disagree = 2

Neither agree nor disagree = 3

Somewhat agree = 4

Strongly agree = 5

Burglar Perspective:

Perception of Dynamic Guardianship in the neighbourhood:

1. I paid attention to the overall activity level while selecting a target residence.
2. My choice of a target residence was affected by the observed activity in the virtual neighbourhood.
3. The visible activity in the virtual neighbourhood decreased the attractiveness of a potential target.
4. The visible activity around a potential target decreased its attractiveness.
5. My confidence in getting caught was influenced by the perceived level of activity.
6. I would have burglarized places that appeared empty.
7. I would have burglarized places that appeared occupied.
8. I would have targeted a house without visible activity.
9. I would not have targeted a house equipped with Smart Home Devices such as cameras or self-closing blind

Burglar's Decision-Making Process:

10. I think the neighbourhood was vulnerable to possible break-ins.
11. When deciding whether to burgle a place, I considered cues related to possible target-hardening devices (such as cameras).
12. I avoided residences with target-hardening devices (such as cameras).
13. The discovery of an ongoing activity at a targeted location impacted my decision to carry out a burglary.

14. Certain factors such as SHDs (such as ring cameras, self-closing blinds) caused me not to burglarize a particular place.

Factors Influencing Risk Perception:

15. I assessed how likely I was to get caught while planning a burglary.
16. I was less likely to commit a burglary if there is a good chance of getting caught during or after the burglary
17. If I burgled this neighbourhood, I am likely to get caught
18. I think this neighbourhood would have been an easy target
19. I considered the likelihood of getting caught while committing a burglary

Resident Perspective:

1. Not using SHD is a serious threat to my safety
2. A burglary can cause severe mental health issues (for the homeowner).
3. The longer you wait to install an SHD, the greater the likelihood of a burglary
4. If I do not install an SHD my home is at a higher risk of getting burgled while I am away.
5. Whenever I'm out and about I will worry about a possible burglary at home.
6. I will have to carry part of the responsibility of a burglary, if no SHD was installed.
7. I can protect my own resources, such as free time and energy, by installing SHDs.
8. I can still protect myself from a burglary even if I do not install SHDs.
9. It is more convenient to rely on other preventative measures of burglary than SHDs.
10. It will save me money if I do not install an SHD.
11. I can avoid the hassles of installing an SHD.
12. I will spend less time acquiring an SHD by not installing one.
13. I will be less concerned about the security of my privacy if I am not installing an SHD.
14. I will not become a victim of burglary if I install an SHD.
15. The surrounding neighbourhood will be safer after I installed an SHD.
16. The attractiveness of my home to a burglar will decline if I install an SHD.
17. I will be able to find a suitable SHD to install at home.
18. I can install an SHD if necessary.
19. My friends will not believe that I am protected against burglaries if I do not use SHDs.
20. Those who live with me or around me will not appreciate it if I install SHDs.

Appendix D

Video Engagement Scale

All Questions are answered on a 5-point Likert Scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

Strongly disagree =1

Somewhat disagree = 2

Neither agree nor disagree = 3

Somewhat agree = 4

Strongly agree = 5

1. After the video ended, I felt as if I was coming back into the ‘real’ world-
2. When I was watching for a while, it seemed as if I was walking through the neighbourhood in my mind.
3. As I watched the video, in my imagination I was in the world of the video.
4. While watching, I was hardly aware of my surroundings.
5. I felt as if I was experiencing the neighbourhood's ambiance and activities firsthand.
6. In my imagination, it was if I were walking through a real neighbourhood.
7. While watching, I felt like I was present at the events in the video.
8. The video appeared realistic to me.
9. I found the virtual neighbourhood scenes impactful.
10. The video evoked emotional responses from me.
11. While watching, I was completely focused on the video.
12. While watching the video, I was fully concentrated on it.

Appendix E

Personality Scale

All Questions are answered on a 5-point Likert Scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

Strongly disagree =1

Somewhat disagree = 2

Neither agree nor disagree = 3

Somewhat agree = 4

Strongly agree = 5

The next questions are about your personality. Please indicate the extent to which you agree with the following statements.

- I would be quite bored by a visit to an art gallery.
- I plan ahead and organize things, to avoid scrambling at the last minute.
- I rarely hold a grudge, even against people who have badly wronged me.
- I feel reasonably satisfied with myself overall.
- I would feel afraid if I had to travel in bad weather conditions.
- I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed.
- I'm interested in learning about the history and politics of other countries.
- I often push myself very hard when trying to achieve a goal.
- People sometimes tell me that I am too critical of others.
- I rarely express my opinions in group meetings.
- I sometimes can't help worrying about little things.
- If I knew that I could never get caught, I would be willing to steal a million dollars.
- I would enjoy creating a work of art, such as a novel, a song, or a painting.
- When working on something, I don't pay much attention to small details.
- People sometimes tell me that I'm too stubborn.
- I prefer jobs that involve active social interaction to those that involve working alone.
- When I suffer from a painful experience, I need someone to make me feel comfortable.
- Having a lot of money is not especially important to me.

- I think that paying attention to radical ideas is a waste of time.
- I make decisions based on the feeling of the moment rather than on careful thought.
- People think of me as someone who has a quick temper.
- On most days, I feel cheerful and optimistic.
- I feel like crying when I see other people crying.
- I think that I am entitled to more respect than the average person is.
- If I had the opportunity, I would like to attend a classical music concert.
- When working, I sometimes have difficulties due to being disorganized.
- My attitude toward people who have treated me badly is “forgive and forget”.
- I feel that I am an unpopular person.
- When it comes to physical danger, I am very fearful.
- I’ve never really enjoyed looking through an encyclopedia.
- I do only the minimum amount of work needed to get by.
- I tend to be lenient in judging other people.
- In social situations, I’m usually the one who makes the first move.
- I worry a lot less than most people do.
- I would never accept a bribe, even if it were very large.
- People have often told me that I have a good imagination.
- I always try to be accurate in my work, even at the expense of time.
- I am usually quite flexible in my opinions when people disagree with me.
- The first thing that I always do in a new place is to make friends.
- I can handle difficult situations without needing emotional support from anyone else.
- I would get a lot of pleasure from owning expensive luxury goods.
- I like people who have unconventional views.
- I make a lot of mistakes because I don’t think before I act.
- Most people tend to get angry more quickly than I do.
- Most people are more upbeat and dynamic than I generally am.
- I feel strong emotions when someone close to me is going away for a long time.
- I want people to know that I am an important person of high status.
- I don’t think of myself as the artistic or creative type.
- People often call me a perfectionist.
- Even when people make a lot of mistakes, I rarely say anything negative.
- I sometimes feel that I am a worthless person.

- Even in an emergency I wouldn't feel like panicking.
- I wouldn't pretend to like someone just to get that person to do favors for me.
- I find it boring to discuss philosophy.
- I prefer to do whatever comes to mind, rather than stick to a plan.
- When people tell me that I'm wrong, my first reaction is to argue with them.
- When I'm in a group of people, I'm often the one who speaks on behalf of the group.
- I remain unemotional even in situations where most people get very sentimental.
- I'd be tempted to use counterfeit money, if I were sure I could get away with it.

Appendix F

Self-reported delinquency

The following questions are questions concerning the past two years. You should indicate per question how often you have done the activity listed.

Answer categories:

1 = never

2 = 1-2 times

3 = 3-5 times

4 = 6-10 times

5 = more than 10 times

During the past year, how often have you …

- … damaged walls, doors or something else with spray paint or a marker?
- … damaged or broke something that was not yours?
- … set something on fire?
- … stole something from a shop worth less than 5 euros?
- … stole something from a shop worth more than 5 euros (e.g. clothes, electronics or something else)?
- … bought something from someone where you suspected or knew the item was stolen (e.g. a bike, phone, tablet, clothes or something else)?
- … stolen a bike?
- … stolen a scooter or moped?
- … burgled a house to steal something?
- … broken into a car to steal something?
- … burgled elsewhere to steal something (e.g. a shop, school or company)?
- … robbed or mugged someone?

- … stolen something from someone or taken their possessions (e.g. money, a phone, clothes or something else)?
- … threatened someone to frighten them, make them do something or to take something from them?
- … kicked or hit someone on the street?
- … kicked or hit someone on the street and injured this person?
- … sold drugs like weed, somewhere that was not in a coffeeshop?
- … sold or used drugs like XTC, cocaine or speed?
- … carried a knife or other weapons on your person?
- … used a knife or other weapon?
- … ended up in a fight?
- How often in the last 12 months have you been involved in a fight?
- How often in the last 12 months have you been involved in a fight and got injured in such a way that required medical attention?

Appendix G

Debriefing

Thank you for participating! You have reached the end of this study.

The primary objective of this study was to examine how individuals perceive guardianship in residential neighbourhoods, particularly focusing on differences between daytime and nighttime scenarios. We aimed to explore how factors such as observed activity levels (self-closing blinds) and the presence of smart home devices (cameras) influence perceived guardianship from both burglars' and residents' perspectives.

During the study, you were shown two videos displaying simulated neighbourhood scenarios, one during daytime and the other during nighttime. One condition included smart home devises such as cameras and the other condition included self-closing blinds.

If you have any concerns, questions, remarks, want to withdraw or want to know the outcomes of the study, do not hesitate to contact:

L.A.Müller
Mail: X (taken out due to privacy rules)

or the supervisor of this study:

Iris Van Sintemaartensdijk
Mail: X (taken out due to privacy rules)

Appendix H

Table Sample Characteristics

Table 1

Sample Characteristics

		Condition				Total Sample
		Resident		Burglar		
		Curtains	Camera	Curtains	Camera	
Count		30	26	24	28	108
Mean Age		32.33	31.07	26.33	30.17	30.13
Gender	Female	25 (83.3%)	17 (65.4%)	19 (79.2%)	21 (75%)	82 (75.9%)
	Male	5 (16.7%)	7 (26.9%)	5 (20.8%)	7 (25%)	24 (22.2%)
	Non-Binary	0	2 (7.69%)	0	0	2 (1.85%)
	Other	0	0	0	0	0
Nationality	German	5 (16.7%)	6 (23.1%)	9 (37.5%)	7 (25%)	27 (25%)
	Dutch	0	1 (3.85%)	1 (4.17%)	2 (7.14%)	4 (3.7%)
	American	12 (40%)	11 (42.3%)	6 (25%)	8 (28.6%)	37 (34.3%)
	Other	13 (43.3%)	8 (30.8%)	8 (33.3%)	11 (39.3%)	40 (37%)
Education	High-School Diploma	8 (26.7%)	5 (19.2%)	5 (20.8%)	9 (32.1%)	27 (25%)
	Bachelor's Degree	16 (53.3%)	15 (57.7%)	14 (58.3%)	14 (50%)	59 (54.6%)
	Master's Degree	3 (10%)	4 (15.4%)	3 (12.5%)	3 (10.7%)	13 (12%)
	Other	3 (10%)	2 (7.69%)	2 (8.33%)	2 (7.14%)	9 (8.33%)