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Seeing is Believing? Comparing Negative Affect, Realism and Presence in Visual Versus Written Guardianship Scenarios

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ABSTRACT

We compared participant responses on three written guardianship scenarios versus visualized versions of the same scenarios in terms of realism, presence, negative affect elicited by the situation, perceived risk, and the choice to intervene. We find that people who received the visual scenarios report higher presence, but not realism, than those who received the written version. Furthermore, visual scenarios elicited stronger negative affect and resulted in a lower likelihood to intervene. Finally, presence, but not negative affect, mediated the relation between condition and the choice to intervene. Implications of the visual scenario method for future research are discussed.

The use of hypothetical scenarios, also referred to as vignettes, is widespread in a range of scientific disciplines, such as communication science, psychology, behavioral economics, sociology, and also criminology, and has been applied in a large variety of behavioral decision-making domains. Scenarios are short written descriptions of hypothetical situations. Research participants are generally asked to imagine themselves in the described situation or to identify with it, and then respond to a number of questions such as how they perceive the situation and what they would do if they would find themselves in it. The scenario method is a versatile, effective, low-cost, and efficient method of data collection about how people would act in situations that are outside of the purview of other methods, for example because of their sensitive nature, prohibitive cost, or infrequent occurrence (Collett and Childs 2011:13).

The scenario method gained traction in criminology in the early 1990s mainly due to the ground breaking work on deterrence and rational choice by Nagin and colleagues (e.g., Klepper and Nagin 1989; Nagin and Paternoster 1993, 1994), which showed that the scenarios carry several important advantages over other written methods for understanding criminal behavior, such as surveys and interviews. For one thing, scenarios provide the possibility for experimental variation (e.g., varying the likelihood of arrest or severity of a penalty), which allows for a detailed understanding as to how such variables affect criminal intentions. Additionally, scenarios enable linking stable variables, such as personality traits or background characteristics, to state variables, like perceived sanction risk, and behavioral intentions, within a single model (Nagin and Paternoster 1993; Piquero and Tibbetts 1996; Van Gelder and De Vries 2012). Furthermore, scenarios can provide the context in which attitudes, norms, values, and intentions are measured and hence are less crude measures compared to surveys (e.g., Finch 1987). As Klepper and Nagin (1989) observe, survey questions that do not provide contexts may introduce measurement error when different respondents infer unique circumstances surrounding the hypothetical situation. That is, due to the contextual detail that can be provided by scenarios, respondents are given less degrees of freedom to impute their own details to

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the situation or their definition of what constitutes illegal behavior (Piquero and Tibbetts 1996). The descriptive information provided by scenarios, in short, can better locate attitudes, norms, values, or behavioral intentions in specific situations rather than asking about these features in a non-situated, abstract way.

However, the written scenario method also carries some important limitations. For one thing, not only may scenarios fail to capture relevant nuances of social experience, the validity of a scenario also relies in part on the degree to which research participants are able to imagine themselves in the described hypothetical situation (Collett and Childs 2011; Parker and Manstead 1993). Those with a limited ability to imagine the situation may respond differently to the scenario compared to those who have no problems doing so. These issues may be particularly relevant in unconventional, unethical, or uncommon situations, as is frequently the case in crime research, which—in turn—can result in weaker correlations between behavioral intentions as measured with a scenario and actual behavior. As Exum and Bouffard 2010 observe: "When studying conventional behavior, participants generally have little reason to conceal their intentions to engage in the behavior or their actual involvement in the behavior. Yet, when the targeted behavior is imprudent/illegal, participants' level of social desirability may motivate them (consciously or unconsciously) to under-report their intentions and/or behaviors."

Another limitation of written scenarios is the fact that if certain behavior in everyday life would be accompanied by intense emotions or visceral responses (e.g., aggression or risky sexual behavior), scenarios may be unable to accurately measure decision-making tendencies as they are limited in the extent to which they can elicit such emotional or visceral reactions in people (Ditto et al. 2006; Exum and Bouffard 2010). In their evaluation of the ability of scenarios to manipulate appraisal and emotion, Parkinson and Manstead (1993:296) argue that the narrative representation of emotional events cannot be treated as functionally equivalent to corresponding real-life encounters because emotional reactions described in fixed written text are unable to capture the dynamic social reality of emotion production in real life.

One of the reasons why written scenarios may sometimes fail to elicit presence and trigger emotions is that they are still only able to convey a modest amount of contextual information compared to real-world situations. Consider, for example, a scenario starting out with the text "Imagine you are having a beer in a local bar with several friends." Even a detailed description of this bar (e.g., "crowded, noisy, with television screens broadcasting sports, and several individuals making a very intoxicated impression") would still fail to convey potentially relevant information regarding what the bar looks, the type of people in it in terms of race, gender, age, the way they dress, look at the participant, and are distributed over the premises, and the sounds in the bar (level, pitch, intensity). Moreover, scenarios are limited in their ability to provide information about the non-verbal behavior of others—such as their facial expressions of anger, happiness or contempt or body posture—which signal important cues determining perceivers' social responses.

Visualizing scenarios

To address some of these limitations, this study examines the potential of using visual (i.e., filmed) scenarios as a substitute for their written counterparts. Visual scenarios can have a number of important advantages over written ones. For one thing, compared to written scenarios, they can convey a much larger amount of contextual information. Christian, Edwards, and Bradley (2010), for example, argue that the superior ecological validity of visual scenarios over written ones is most likely due to a more accurate depiction of contextual details in video-based scenarios, which in turn increases their physical and psychological realism. Written scenarios, which lack this type of realism, could therefore be less able to create a sense of identification with the situation of interest, which may, in turn, result in lower levels of ecological validity.

The visual scenario method bears resemblance to the method of photo elicitation interviews, which involves the use of photographs during research interviews. The idea behind photo elicitation is that the

use of photos can serve as an aid to participant memory (Harper 2002), and elicit not only more information from participants but also information of a different nature than written data such as interviews (Bolton, Pole, and Mizen 2001). Visual scenarios, however, differ in crucial ways from photo elicitation interviews. For one thing, rather than relying on a static image, visual scenarios are dynamic and depict a process unfolding over time. Furthermore, whereas photo elicitation is used to enhance the recall of events that happened in the past, visual scenarios aim to measure how people respond to a certain type of situation in the here and now. Importantly, the visual scenario does not serve as a tool for encouraging participants to elaborate or free associate on a topic but rather intends to layout a specific situation in as much detail as possible and to have participants witness an event as it unfolds.

We argue that visual scenarios increase people's sense of subjectively being in the depicted situation, which is commonly referred to as 'presence', as well as the emotions or affect they experience in the situation. In turn, we assume that increased presence and emotional state influence people's behavioral intentions. In this article, we examine these assumptions in the context of a criminal event from the perspective of a bystander, in criminological research often termed "guardianship".[1] The choice for guardianship is principally guided by two considerations. For one, compared to offending, and to a lesser extent also to victimization, guardianship decision-making research is much less prevalent in criminological research (Reynald 2010, 2011b). Second, guardianship decision-making may require human intervention in a situation that may trigger intense feelings of fear and worry (cf. the Bystander Effect; Darley and Latané 1968). As such, the gap between asking people to imagine experiencing a situation on the basis of a short piece of written text versus seeing it play out in front of their eyes may be particularly relevant in the context of guardianship. Below, we first elaborate on the main constructs of interest prior to explaining the design of the study.

Presence

The subjective sense of "being there" is often referred to as presence (Hartmann et al. 2016). Presence as a psychological state is a term with origins in virtual reality research, where it has been observed that users of virtual reality systems can feel physically located in the virtual space rather than the physical place where the user's body is located, generating a subjective sense of being and acting in the virtual environment (Slater 2004; Slater et al. 2006).

Research suggests that people can experience presence when viewing or engaging in a variety of hypothetical situations, including playing video games, watching television, or reading narratives (Hartmann et al. 2016). According to Schubert and Crucius (2002:3), the underlying psychological phenomenon may be identical for different media: "Subjectively, for all three forms the metaphor of transportation is used. In all three media, the actual physical environment (VR laboratory, cinema, reading chair) is suppressed in favor of an alternative, medially presented and cognitively construed environment. (….) Furthermore, it can be measured in equivalent ways with self-reports, although the scores may not be comparable." Since presence is typically assumed to depend on certain features of the (virtual) environment, for instance which interactions are possible, and which interaction techniques are used (Regenbrecht and Schubert 2002; Shubert and Crucius 2002), the extent to which people experience presence is likely influenced by the possibilities the particular medium offers to increase realism. As mentioned, filmed scenarios are likely to offer more of such possibilities as compared to written scenarios (Christian, Edwards, and Bradley 2010). Importantly, increases in presence may lead to user responses that more closely resemble actual responses in the real world (Van Gelder, Otte, and Luciano 2014). In the context of vignette research, this means

[1]This study is based preliminary data from the currently ongoing Visualizing Crime Project, which involves written and visualized scenario versions of the same criminal events. The situations depicted are described/visualized either from the perspective of the offender, that of the victim, or that of an observing bystander.

that behavioral intentions as provided by participants have higher ecological validity when people experience a greater presence in a depicted situation.

Negative affect

Most scenario-based research in criminology has taken a rational choice or deterrence perspective in which decision makers are assumed to make deliberate choices based on cost-benefit calculations prior to committing to a certain course of action (Exum and Bouffard 2010). In criminology, it is increasingly argued that the criminal decision making process may deviate from the assumption of rationality, and is also led by emotions (e.g., Bouffard 2002; Bouffard, Exum, and Paternoster 2000; Nagin 2007; Van Gelder et al. 2013). Indeed, an increasing number of studies reveals negative affect to be an important predictor of criminal choice (e.g., Van Gelder and De Vries 2012, 2014). We propose that a similar point applies to guardianship, which often puts pressure on guardians to intervene in a potentially conflictive and dangerous situation that is likely to elicit strong emotions such as fear, stress, or discomfort.

Studies that have addressed differences between methods in terms of their ability to elicit emotions suggest that written scenarios may not be optimally suited for this goal. Collet and Childs (2011), for example, investigated the difference between written vignettes and a laboratory experiment in a study on social exchange and alternative dispute resolution. The authors compared the affective responses of participants on two types of experimental simulations – written vignettes and a laboratory experiment—and found that the laboratory experiment elicited a higher intensity of emotions in participants compared to the vignettes. However, another study showed that this limitation of written vignettes can partly be overcome through the use of visual scenarios. In a study by Ditto et al. (2006), male condom users either saw a video or read a description of a scenario depicting a young couple deciding whether to have sex without a condom. The results indicate that those participants seeing the video expressed a greater likelihood of having unprotected sex in the situation than did participants reading the description.

Guardianship and the bystander effect

Guardianship refers to the physical or symbolic presence of an individual (or group of individuals) that acts (either intentionally or unintentionally) to deter a potential criminal event (Hollis-Peel et al. 2011). A guardian is someone whose mere presence can prevent crime (Cohen and Felson 1979). Guardianship can be formal (e.g., the police or security guards), but it is most often conceptualized as informal, referring to the effect of ordinary citizens who happen to be around and might serve as potential witnesses to crime. Guardianship is an emerging topic in crime research. An increasing body of empirical research is now showing the importance of guardianship as a crime prevention and control mechanism (Hollis-Peel and Welsh 2014; Reynald 2009, 2010, 2011a). Indeed, potential offenders are reluctant to commit a crime in the presence of informal guardians, due to the increased likelihood of detection. As such, people often prevent crime from occurring without being aware of it, just by being present in a given situation. While early research on guardianship focused almost exclusively on the crime prevention effect of the mere presence or availability of guardians (e.g. Garofalo and Clark 1992), more recent research has elucidated guardianship as a multi-dimensional process involving action stages beyond mere presence (2011a; Reynald 2009). In addition to presence or availability, guardians can also prevent crime through supervision, and often serve to interrupt crimes in progress through intervention (Reynald 2011b). In one of the few criminological studies to study guardian decision-making, Reynald (2010) explored factors related to intervention behavior by guardians who witnessed crime-related events while at home. Results showed that the willingness to intervene and the type of intervention was determined by a range of individual and situational factors. These included the guardian's sense of responsibility for intervening, their perception of

their physical competence to intervene, the severity of the incident and the risk to their own personal safety.

There are overlaps between guardianship and the much better researched concept of bystander intervention (Darley and Latané 1968; Fischer et al. 2011), but they also differ in some crucial respects. While guardianship refers to the process through which the physical or assumed presence and/or action of guardians prevents or disrupts offending behavior, the bystander intervention literature specifically addresses the question of how guardians respond when an offender does decide to strike despite their presence. One pertinent insight that emerges from this research is the bystander effect or that the likelihood that a guardian intervenes (e.g., by stopping the offender, or helping the victim) depends on the number of other guardians present. Specifically, people are *less* likely to intervene to the extent that there are *more* other guardians present. This bystander effect appears to be due to a combination of factors including diffusion of responsibility (i.e., people experience less personal responsibility to intervene when others may do so as well) and audience inhibition (i.e., fear of negative evaluation by the other guardians). These processes have been found to be coupled with emotional experiences (Van Bommel et al. 2014).

The present study

In this study, we explore differences in responses between written scenarios and their visual analogs in terms of the degree of presence and realism, the (negative) emotions they elicit, and the extent to which both influence behavioral intentions about intervening in conflict situations. Specifically, three different scenarios depict the theft of €50,- as witnessed by the potential guardian (i.e., the research participant). The visual scenarios were developed through the use of point-of-view (POV) cameras, with create a subjective viewpoint from which the viewer observes the situation as if s/he is in it. Therefore participants experience a situation as it plays out in front of them in real time as the events unfold. The written scenarios depicted the exact same situations and also used the first-person perspective of the guardian.

We expect that participants in the visual scenario condition experience higher presence compared to those reading the scenario (cf. Christian, Edwards, and Bradley 2010; Hartmann et al. 2016) but that there is no difference in perceived realism as the narrative is identical in both conditions. Furthermore, we expect the visual condition to elicit stronger negative feelings (i.e., affect), compared to the written condition. Finally, both negative affect and presence are expected to predict intervention behavior, and to mediate the effect of condition on the choice to intervene or not. That is, we expect both those who experience higher negative affect and those who experience higher levels of presence to be less likely to intervene.

We examine these expectations using preliminary data from the Visualizing Crime Project. This currently ongoing project examines differences between visual and written scenarios and involves different perspectives, that of the offender, the victim, and the guardian of the same criminal incident (i.e., the theft of €50.-).

Method

Participants and design

Data were collected among male students of a mid-sized Dutch university. Given that the actors representing the victim, offender, and guardian were all male in the scenarios, only men could participate in the study. The current sub-sample who received the guardian perspective was 83, which formed the basis for the present analyses. Participants (M_{age} = 22.57, SD = 3.20) were approached by an experimenter in the common areas of the university, and were offered a €2.50 university cafeteria voucher in exchange for their participation. As additional incentives for participation, participants were entered into a raffle in which they could win gift vouchers of €25.-, €50.-,

or €100.-, and they received their personality profile based on their scores on the Dutch version of the HEXACO Personality Inventory-Revised (De Vries, Ashton, and Lee 2009), which was also included in the study but not used in the current paper. Participation in the study was voluntary, and the study took about 30 minutes to complete.

Procedure

Participants were given access to a laptop, which was used to present the stimulus materials and to register the data. After giving their informed consent, participants started with the HEXACO personality inventory followed by the scenarios. Participants were randomly assigned to either the visual or the written scenario condition. Each participant received three scenarios, which depicted a similar criminal event, the theft of €50-, in three different environments (a gym, a coffee bar, and an ATM). We opted for using different scenarios because aggregating participant responses across multiple scenarios attenuates the influence of individual attitudes vis-à-vis particular situations, which reduces error variance and ensures a more valid estimate of the typical response to a criminal event compared to responses to a single scenario (Van Gelder and De Vries 2012).

All three incidents had the same basic structure, only differing in the environment in which it took place: A victim had lost a €50,- note; a perpetrator had deliberately taken the money but denied having taken it; and a guardian, i.e., the respondent, had witnessed the entire sequence of events. In the visual condition, participants watched an audio-videotaped scene of each incident on the computer as it unfolded (see Figures 1–3). The length of the different incidents was roughly the same varying between 1 minute and 41 seconds, and 1 minute and 49 seconds.

In the written description condition, participants read an exact literal transcript of the same incidents. For example, the written description of the Coffee Bar scenario reads as follows (full descriptions of the other two scenarios are available upon request):

> Imagine the following situation: You are in a coffee place somewhere in town, drinking a coffee and reading a magazine. A woman passing by the table in front of you stops and you hear her say the following to a young man, person 1, sitting at that table: 'Here, this was lying on the ground'. She then walks out of the café. One moment later, another young man, person 2, enters the café. He appears to be searching for something. He walks up to the table where person 1 sits and the following conversation unfolds between them:

Figure 1. Screenshots of the guardian perspectives in the Coffee Bar scenario.

Figure 2. Screenshots of the guardian perspectives in the ATM scenario.

Figure 3. Screenshots of the guardian perspectives in the gym scenario.

Person 2: 'Sorry, I just sat here and I lost a bill of 50 euro. Did you find it?'
Person 1: 'I didn't see anything.'
Person 2 then walks to the bartender and asks her: 'I just sat there and I think I lost a bill of 50 euro. Did someone maybe give that to you?'
Bartender: 'No, nobody gave me anything. But I did see a woman walk out and stopping near the table that man is sitting at (points to person 1), so maybe you should ask him'. Person 2 walks to person 1 and asks: 'I heard from the lady behind the bar that a woman just walked by and picked something up. Did you see her picking something up from the floor?'
Person 1 (denying) 'I am just reading'.
Person 2: 'Well, you do notice it when someone bends down and picks something up, right?'
Person 1: 'Listen, I am just reading'.

Person 2: (annoyed and pointing to the table) 'So you did not notice that a woman walked by, bent down and picked something up?'
Person 1: 'No, I didn't see anything'
Person 2: 'I don't believe it'.

Then person 2 turns to you and asks: 'Did you see what just happened?'

Variables

Realism was measured with a scale consisting of six different items using 5-point scales that was specifically constructed for the present study, e.g., "The situations were realistic", and "I had the idea the scenarios were fictitious (contra-indicative) (*1 strongly disagree- 5 strongly agree*). α = .83.

Presence was measured using an abbreviated and adapted 11-item version of the Igroup Presence Questionnaire (IPQ) (Schubert, Friedmann, and Regenbrecht 2001) (α = .75), e.g., "I had a feeling I was present in the scenario", and "I was not aware of my real environment" (*1 strongly disagree- 5 strongly agree*). The phrasing of several of the items was altered to match the 'strongly disagree–strongly agree' answering format (which was also the case for most, though not all of the original items).

Negative Affect was measured using the measure developed by Van Gelder and de Vries (2012). The scale included five items per scenario using 7-point scales (*1 strongly disagree- 7 strongly agree*). The items were preceded by the sentence: "Imagine you decide to intervene in support of Person 2]": 'Would this situation make you feel insecure?', 'Do you find the situation frightening?', 'Would you be worried?', 'Would you be nervous?', and 'Does the situation evoke negative feelings in general?' (*not at all-very much)*. A negative state affect scale was computed based on the averaged responses on the negative affect items of the three scenarios (α = .93).

Perceived risk

Two items per scenario, using 7-point scales, measured perceived risk and were preceded by the sentence: "Imagine you decide to intervene in support of Person 2": e.g., 'How likely is it that you will suffer negative consequences?' (*1 very unlikely- 7 very likely)* and 'How big do you think is the chance of a bad ending?' (*1 very small- 7 very large)*. Rather than experimentally manipulating probability, respondents were asked to give their own estimate to avoid the artificiality of furnishing probabilities that respondents could find unrealistic (see Nagin and Pogarsky 2001). The same applies to anticipated severity, which was also measured by two items using 7-point scales, e.g., 'How serious do you consider the possible consequences to be?'(*1 not at all serious- 7 very serious*) and 'How annoying do you find the potential negative consequences?' (*1 not at all annoying- 7 very annoying)*. A perceived risk measure that reflected both probability and severity (*Probability x Severity*) was constructed by multiplying the mean scores of the probability items with the mean scores of the severity items (see Nagin and Paternoster 1993). The composite Perceived Risk measure for the three different scenarios consisted of 6 items (2 per scenario) each based on the Probability x Severity multiplication (multiplying the scores of the first with the second item, and third with the fourth item). The scale had an alpha reliability of .86.

Choice to intervene

The dependent variable, choice to intervene, was measured with two items inquiring about the likelihood that the respondent would intervene. One item was measured with a 7-point scale, e.g., 'How likely is it that you would intervene in support of Person 2′ (*1 very unlikely–7 very likely*), the other item regarded a percentage estimate, e.g., 'Can you give a percentage estimate of the probability that you would help Person 2?' The percentage item was recoded to a 7-point scale and a Choice to Intervene scale was computed on the basis of the mean scores of all 6 (2 per scenario) likelihood items and had an alpha reliability of .51.

Missing data

Across the six main variables, less than 1% of the values was missing. These were treated using robust full-information maximum likelihood estimation (FIML) (Enders and Bandalos 2001).

Results

Means, standard deviations, and correlations of the measured variables are displayed in Table 1. As can be seen in the table, exposure to the visual scenario is correlated with increased presence and negative affect compared to the written scenario, but uncorrelated with realism, perceived risk, and the choice to intervene.

Furthermore, realism is associated with higher presence and a higher likelihood to intervene, implying that people who find the scenario more realistic are also inclined to experience more presence and to indicate that they would intervene. Furthermore, as expected, we find presence to be positively correlated with perceived risk and the choice to intervene, and marginally significantly correlated with negative affect ($p < .10$). Finally, more negative affect is related with a higher perceived risk.

Next, we examined differences between the written and scenarios in terms of presence and realism. Because both conditions are identical in terms of narrative, we did not anticipate a difference in terms of perceived realism. The results of an independent samples *t-test* showed this was the case, $t(79) = 0.499$, n.s. However, the visual version of the scenario was expected to elicit higher degrees of presence in participants. This expectation was confirmed $t(79) = -3.163$, $p < .01$. Furthermore, and also in line with expectations, negative affect was higher in the visual scenario condition compared to the written scenario condition, $t(79) = -2.840$, $p < .01$, whereas no differences emerged for perceived risk $t(79) = -0.861$, n.s. Finally, no differences between emerged for the choice to intervene. Although participants in the visual scenario condition were slightly less likely to intervene, this difference was not significant $t(79) = 1.324$, n.s.

In a final step, we tested whether presence mediates the effect of video versus written scenario condition on the choice to intervene or to refrain from intervening. To this end, we conducted path analysis in Mplus (Muthén and Muthén 1998–2015). Fit statistics were satisfactory: standardized root mean square residual (SRMR) = .03; Tucker Lewis index (TLI) = .96; comparative fit index (CFI) = .99; root mean square error of approximation (RMSEA) = .05 (Hu and Bentler 1999). The results of the path analysis are displayed in Table 2. The scenarios had a significant effect on presence and negative affect. In turn, higher presence increased the choice to intervene. Higher negative affect decreased the likelihood that people said they would intervene, although this effect was only marginally significant. Due to presence and negative affect, people who received the scenario were less likely to intervene than people who received the written scenario.

As can be seen in Table 1, the direct effect of condition on the choice to intervene was not significant. Therefore, instead of testing the total effect, we tested indirect effect (see Rucker et al. 2011; Shrout and Bolger 2002). Tests of the indirect mediating effects, reported under "Indirect

Table 1. Descriptive statistics of and correlations among main study variables (N = 83).

Variables	1	2	3	4	5	6
1. Condition[1]	-	-	-	-	-	-
2. Realism	−.06	-	-	-	-	-
3. Presence	.34**	.40**	-	-	-	-
4. Negative affect	.30**	.01	.22†	-	-	-
5. Perceived risk	.10	.10	.23*	.63**	-	-
6. Choice to intervene	−.15	.26*	.29**	−.16	−.05	-
M	.50	3.55	2.95	3.19	10.75	4.60
SD	.50	.75	.57	1.10	6.45	1.17

M = mean; *SD* = standard deviation. [1] coding: 1 = written, 2 = visual
† $p < .10$; * $p < .05$; $p < .01$ (two-tailed).

Table 2. Path analysis results of choice to intervene on Presence, Negative affect and Condition (N = 83).

Effects	*B*	(SE)	STD
Effects of mediators on scenario			
Visual scenario -> Presence	0.378**	0.120	0.330
Visual scenario -> Negative affect	0.670**	0.232	0.306
Effects of mediators on Choice to intervene			
Presence -> Choice to intervene	0.845**	0.220	0.412
Negative affect -> Choice to intervene	−0.199†	0.116	−0.186
Visual scenario -> Choice to intervene	−0.526*	0.254	−0.224
Indirect effects			
Visual scenario -> Presence -> Choice to intervene	0.319*	0.131	n.a.
Visual scenario -> Negative Affect -> Choice to intervene	−0.134	0.091	n.a.

B = unstandardized coefficients; SE = standard error; STD = standardized coefficients.
† $p < .10$; * $p < .05$; $p < .01$ (two-tailed).

effects" in Table 2, revealed that the relation between exposure to the scenario and choice to intervene was mediated through presence, but not through negative affect.

Discussion

Written scenarios have proven to be a versatile and inexpensive research method tool prompting respondents to consider a hypothetical situation. However, researchers have also pointed out a series of limitations of this method. One source of concern has been the degree to which scenarios capture the reality of a situation and hence the extent to which participant responses towards a short written narrative are actually predictive of their behavior in the real world. Furthermore, scenarios have been argued to be limited in their ability to accurately capture a decision maker's psychological reactions to the situation. Particularly, if certain behavior is normally associated with intense emotions or visceral influences, such as aggression or risky sexual behavior, written scenarios are limited in the extent to which they can elicit the relevant emotional reactions in people. Finally, written scenarios are only able to convey modest amounts of contextual information.

To remedy some of these limitations, we explored the potential of visual scenarios using preliminary data of the Visualizing Crime Project. We examined differences in participant responses to three different written scenarios of a minor criminal incident, and the visual equivalents of the same scenarios from the perspective of a guardian witnessing the event. The results indicate that the participants seeing the visual versions of the scenario experienced more presence and greater negative affect than those who had read the written scenario. As expected, no differences in perceived realism emerged between both types of scenario. Furthermore, presence and negative affect were significantly correlated. We also explored the direct and indirect effects of our manipulation on the choice to intervene, and found presence, but not negative affect, to mediate the relationship between experimental condition and choice to intervene. Visual scenarios lead to an increaed sense of being in the depicted situation and a lower likelihood to intervene. In other words, research designs relying on written scenarios to examine guardianship my lead to an overestimation of the likelihood that people would intervene in a situation.

Overall the results of this study support the idea that visual scenarios carry important advantages over written scenarios in terms of ecological validity. Beyond achieving higher levels of immersion in the decision making situation and a greater ability to elicit emotions, visual scenarios offer an important additional advantage over the traditional written scenarios that has not yet been discussed in this article. Due to the fact that subjects experience a scenario situation in real time, visual scenarios allow for taking detailed physiological measurements and measuring the reactions of participants as the scene unfolds and to particular events during the course of the scenario. Whereas social desirability may obscure the actual behavioral intentions of people when they self-report their emotions and intentions, this is not the case for physiological reactions to a situation

(e.g., increased skin response, heart-rate). These reactions can teach us a lot about how participants experience situations and specific events during a sequence of events. Additionally, special software that allows for automatic analysis of facial expressions can be used to determine which emotions participant experience at a given time while they watch the scenario unfold.

Of course, in spite of its strengths, visual scenarios only go so far in circumventing the limitations of its written counterpart. In this sense, the choice for using the more elaborate and expensive visual scenario versus written ones in part reflects a tradeoff between incremental validity on the one hand, and effort and research budget on the other. Furthermore, alternations or additions to written scenarios are much easier made and can also be made ad hoc. In the case of visual scenarios, changes are likely to imply entirely rerecording the stimulus material. That said, although visual scenarios that are seen on a computer screen are more expensive to make than a written vignette, its cost is certainly not prohibitive for the average research budget. For the present study, for example, we used standard GoPro POV cameras and worked with amateur actors. Additionally, a vignette can be reused in new studies. For example, in criminology certain vignettes like the 'bar fight' scenario have been used in a series of studies (e.g., Exum 2002; Mazerolle, Piquero, and Capowich 2003; Schoepfer and Piquero 2006).

Furthermore, we note that the present findings do not imply that the research community should discard written scenarios altogether; indeed, there are research questions for which written scenarios may have higher validity than visual scenarios. Those criminal acts that involve little action or do not involve a victim being present, such as white-collar crime or (tax) fraud and/or crime are not likely to elicit intense feelings are better measured using written vignettes and can in fact be hard visualize. Another case in point would be research on the question of how the general public forms subjective impressions of criminal incidents. In real life, people often learn about criminal events through written descriptions (e.g., newspaper articles; Internet). Given that these public perceptions are inextricably linked with the perceived legitimacy of the legal system, it is important to study how such a relatively abstract, context-free written description influences citizens' perceptions of criminal offenders, their victims, and the formal actions of the legal system to restore a sense of justice. This suggests promising avenues for further research to study the influence of written versus visual scenarios.

The visual scenarios in the present study were created using actors playing out the scenario and recorded with POV cameras. The criminal events in this study were staged, which carries the important advantage of having comparable situations and the possibility of creating different perspectives on the same criminal event. Nonetheless, the use of (amateur) actors also carries the risk of artificiality. One way to overcome both the artificiality of the situation and do away with the logistical and financial challenges of creating a proper stimulus set is the use of body-worn cameras, for instance by security personnel such as police. This seems to be a particularly fruitful avenue of future research.

As a final shortcoming we note that both the written and the visual scenario method are nonreactive as the content and sequence of the story that unfolds stayed the same and there is no active involvement of the respondent over the course of events. Virtual reality (VR) in contrast, allows for an interaction between the participant and his/her environment and therefore more strongly reflects the way events unfold in social life. We think that VR has tremendous potential as a method for studying crime (see also Van Gelder and Van Daele 2014; Van Gelder et al. 2017; see also the article by Meenaghan et al in this special issue). According to Blascovich, Loomis and Beall, (2002), VR increases the power of experimental research because of the increases in realism and hence the impact of the experimental manipulation on research participants. Virtual reality can more directly elicit participants' cognitive and affective processes than other measures like videos or written narratives.

To conclude, scenarios are a useful and common research method for social scientists in general, and criminologists in particular. The well-known drawbacks of this methodology, in conjunction with its ubiquitous use to validate and expand our knowledge, suggest that it is important to look for ways to improve it. The present research attempted to do so by empirically comparing the traditional written scenarios with their visual equivalents. The results underscore that in comparison with

written scenarios, visual scenarios are experienced as more vivid, elicit stronger emotions, and are more likely to prompt responses that are representative for people's actual responses in the real world. This increased ecological validity may make results obtained through visual scenario more reliable, and more likely to conceptually replicate if tested through different research methods, as compared with written scenarios. We conclude that visual scenarios have substantial benefits over written scenarios when answering a range of research questions, and should therefore be a prominent part of the social scientists' research toolbox.

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