CRIMINOLOGICAL ENCOUNTERS

Vol 6(1) 2023
ISSN 2506-7583
DOI 10.26395/CE.2023.1.05

Mixed emotional experience in photographic representations of urban public spaces with CCTV surveillance: A photo vignette experiment

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Keywords: Emotional experience, public space, fear of crime, CCTV, photo vignette experiment

Abstract: CCTV surveillance in urban public spaces is often implemented in order to decrease crime rates. Various studies have also shown interest in if and how CCTV might affect fear of and worries about crime. Yet, a broader account on people's emotional experience of urban public space under CCTV surveillance is currently lacking. Combining insights from the fields of urban studies, criminology, and psychology, the current study reports the effects of the presence of CCTV surveillance on a range of positive and negative emotions in photographic representations of two urban public spaces. In doing so, we have used photos of two urban spaces that more generally are expected to differ in the emotional experience: an alley with graffiti at dusk versus an urban park at daytime. We measured the negative emotions fear, worry, anger, disgust, shame, guilt, and sadness, and the positive emotions trust, awe, and happiness. Results among 1003 members of the Dutch general public show that the emotional reaction to the photographic representations of these urban environments is very diverse, and certainly not limited to the presence or absence of fear and worry. Furthermore, mentioning CCTV as an intervention part of the photographic representation alters this emotional experience: worry is reduced in the alley, but it is also shown that respondents report lower happiness and higher worry in the urban park with CCTV surveillance present, versus absent.

Introduction

The literature reports an explosive growth of CCTV surveillance: *"[i]n less than two decades, it has expanded from a local initiative in a few small towns in the UK (…) to penetrate every major city, in every country, on every continent"* (Norris, 2012, p. 254). While CCTV is certainly not the only instrument used for the management, surveillance, and policing of urban public spaces, scholars have argued that it "*has become the standard way to restrain crime and guarantee security*" (Koskela, 2002, p. 259; also see Piza et al., 2019). For quite some time now it has more or less achieved the status of a standard feature of urban life (Germain et al., 2013; Norris, 2012; Piza et al., 2019; Welsh & Farrington, 2009).

People often express support for CCTV surveillance in urban neighborhoods and/or urban public spaces (Germain et al., 2013; Gill et al., 2007; Honess & Charman, 1992; Spriggs et al., 2005) when implemented for safety and security reasons (Cho & Park, 2017; Gill et al., 2007; Musheno et al., 1978), although a minority has been less accepting (Murphy, 2002), or even annoyed by it (Koskela, 2003). A great variety of studies have shown CCTV surveillance to be effective in the sense that it may decrease crime rates (Welsh & Farrington, 2009; Ceccato, 2020; Piza et al., 2019), especially in settings with specific crime problems such as car parks (Piza et al., 2019; Welsh & Farrington, 2009).

Although studies point towards a decrease in unsafety stemming from CCTV surveillance, whether it is also effective in decreasing *feelings of unsafety* seems to be less clear-cut. There is some evidence that CCTV may reduce feelings of unsafety in urban public spaces (Gill et al., 2014; Lorenc et al., 2013a, 2013b; Zhao et al., 2002; Ceccato, 2020), but at the same time studies report inconclusive findings, combinations of effects, or the findings seem dependent on other interventions aimed at decreasing fear of crime (Ceccato, 2020). A more nuanced view about the emotional experience of being under CCTV surveillance also stems from surveillance studies (Adey et al., 2013; Koskela 2002, 2003, 2012), hinting towards the idea that CCTV surveillance acts as a double-edged sword. For example, people can also be quite ambivalent about being under (CCTV) surveillance: *"on the one hand surveillance cameras increase security but on the other hand they produce mistrust"* (Koskela, 2002, p. 269; also see Ceccato, 2020; Taylor, 2010). Indeed, "*[o]n an emotional level, the attitudes on surveillance are anything but straightforward. The variety of feelings surveillance evokes are enormous: the objects watched can feel guilty without reason, embarrassed or uneasy, irritated or angry, fearful; also safe (Koskela, 1999)"* (Koskela, 2002, p. 269)[1]. Building on such narratives about ambivalence, the current study aims to explore the effects of the presence of CCTV surveillance on a range of positive and negative emotions in photographic representations of two specific urban public spaces: an alley with graffiti at dusk versus an urban park at daytime. More specifically, we aim to explore whether the emotional experience of certain urban public spaces shifts as a function of CCTV presence.

Looking at what emotion theorists in the field of psychology have argued, people in (urban) situations can experience a variety or blend of different emotions (e.g., Heavey et al., 2017; Shoval et al., 2018; Watson & Stanton, 2017). So-called blended emotions – simultaneously experiencing two or more emotions such as a combined state of fear and sadness – are actually quite common (e.g., Ellsworth & Smith, 1988; Watson & Stanton, 2017). These emotions follow from specific appraisals, which refer to the interpretation of one's circumstances or the specific context one is in (e.g., Frijda, 1986, 1987; Smith & Ellsworth, 1985). Assuming that different emotions stem from different appraisals allows us to gain insight into the uniqueness of the experience of specific emotions, and how specific emotions differ from each other (Izard, 1977). It enables us to predict what features from particular urban public spaces – among which CCTV surveillance – are likely to elicit a specific (blend of) emotion(s).

Along this line of reasoning it could be hypothesized that 1) people's experience of urban public spaces under CCTV surveillance includes a wider range of (blended) emotions, beyond just fear and worry (about safety). Opening up to a range of both negative and positive emotions, we mean to move beyond the CCTV-fear/worry relationship in research on urban public spaces. At the same time, 2) it could also be hypothesized that such emotional experience is contingent on the context (in which CCTV surveillance is implemented, and experienced by users of urban public spaces). Again, different emotions may follow from the interpretation of the specific contexts individuals find themselves in. Put differently, it could be expected that the implementation of CCTV surveillance in one situation could stimulate experienced

1 We are aware of the role of gender in the works cited here. At the same time, we would argue that this argument is unlikely to be limited to one particular gender. Obviously, the character and intensity of emotions experienced might differ.

safety and decrease fear and worry, but not necessarily in others (Williams & Ahmed, 2009). We consider it important to better understand people's emotional experience of urban contexts under CCTV surveillance, as means to reflect on the (perceived) suitability or necessity of CCTV surveillance as implemented in different urban public spaces.

In the next paragraph we will outline our method, including a rationale for the particular photographic representations of urban contexts in which we set out to study CCTV surveillance, as well as a rationale for the particular emotions that we have focused on in this study.

Method: Experimental Design

In the current photo vignette experiment we aim to investigate if and how a broader emotional experience in photographic representations of urban public spaces is affected by the presence of CCTV surveillance. We chose an experimental design because it allows for a clean design, keeping all other factors – next to the factors being manipulated – constant. Hence, it is a valuable tool for investigating the unique effect of CCTV presence and for making causal inferences. Random assignment of participants to different conditions of the manipulated variables (in the current study: CCTV presence and the photographic representation of urban public space) removes researcher bias from the study and it averages out differences among participants (e.g., Tabachnick & Fidell, 2007). Although such a clean design makes experiments limited in their external validity, they thus score high on internal validity.

In performing the photo vignette experiment, we selected photos of two urban spaces that people generally perceive and experience quite differently:

1) A photo of an alley with graffiti at dusk. Typically, darkness, limited prospect and opportunities for escape, and lower physical maintenance are considered to be cues that people relate to a perceived threat of crime victimization, and emotions such as worry and fear (Eifler & Petzold, 2022; Fisher & Nasar, 1992; Herzog & Flynn-Smith, 2001; Lupton, 1999; Koskela & Pain, 2000; Struyf, 2020; Lorenc et al., 2013b).

2) A photo of an urban green space at daytime. Quite the contrary, well kept urban green spaces at daytime are likely to be associated with safety (Sreetheran & Van Den Bosch, 2014; Ceccato, Canabarro & Vazquez, 2020), social wellbeing, physical activity, and leisure (Peters, 2010; Konijnendijk et al., 2013; Chiesura, 2004), and hence may also be supportive of a range of more positive emotions such as happiness, awe, and surprise (Chiesura, 2004; Roberts et al., 2019).

This experimental design allows us to compare the emotional experience between these specific urban public spaces represented by the photos, and the role that CCTV plays in this emotional experience. We have looked at an array of different emotions which we address below.

Selection of Emotions

In order to move beyond the CCTV-fear relationship, and to come to a selection of emotions to be included in the current study, we take a closer look at the (criminological, psychological and sociological) literature outlining the diverse emotional experience of urban public spaces. As already mentioned in the introduction, much research on surveillance and policing, as well as urban public spaces more generally, has focused on the emotions **fear** and **worry**. This often relates to urban public spaces which may signal certain threats (of crime). In this regard scholars have made a distinction between the emotional response to immediate threat, referred to as fear, and a more general patterning of repetitive thoughts about future uncertain harm, referred to as worry (Jackson & Gouseti, 2013). What we see in fear of crime studies is that these terms are regularly conflated, but that in the past it is especially the more general patterning of repetitive thoughts about future uncertain harm that scholars have tended to focus on (Hart et al., 2022).

While the emotion fear stems from threats of harmful outcomes/violations in the future, the appraisals of **anger** and **disgust** typically involve harmful outcomes that have already occurred (Phillips & Smith, 2004; Rozin et al., 1999; Van Doorn et al., 2014). That is, anger and disgust are experienced in cases of moral violations and disapproval of those violations (e.g., Haidt, 2003; Izard, 1971, 1977). Anger, then, can be seen as a reaction to the more specific moral violation of incivility or injustice, whereas disgust generally stems from pollution (e.g., Haidt, 2003; Ortony et al., 1988; Rozin et al., 1993). For example, when one is confronted with disorder or vandalism in the urban public space, people can experience

anger (because people might judge it as uncivil) and disgust (because people might judge it as polluting) in response to that violation.

In this light it is also useful to discuss the emotions **shame** and **guilt**. Although shame and guilt are usually triggered in contexts where *oneself* is responsible for a certain violation, they can also be experienced when the violation is done by *someone else*. For example, people can experience shame or guilt because of what someone of the group they associate with has done. The transgression is then seen as an 'image-threat appraisal' (e.g., Lickel et al., 2004). From this perspective, when one is confronted with disorder or vandalism in the urban public space, stemming from other citizens in the community, feelings of shame and guilt might occur.

At the same time, certain aspects of urban public space can also lead to the experience of *positive* emotions. For example, the emotion **awe** is elicited by a heterogeneous set of experiences, among which are beauty and virtue (Keltner & Haidt, 2003). Urban public spaces that contain (scenic) elements that are considered beautiful, such as a high degree of 'greenness' and openness (Chen et al., 2009; Paül i Agustí & Guerrero Lladós, 2021), might then elicit a sense of awe (and a lower level of fear; Kuo & Sullivan, 2001). Although awe is considered a positive emotion, it is important to note that it is not the same as experiencing general **happiness**. Unlike awe, happiness includes a sense of controllability (Frijda et al., 1989). People typically describe successes or enjoyable times spent with other people when they refer to instances of happiness (e.g., Shiota et al., 2007; Smith & Ellsworth, 1985; Smith et al., 1993). This also means that urban public spaces that lack the quality of 'enjoyableness' might elicit a lower degree of happiness.

Finally, several scholars have argued that the emotion fear cannot be understood without considering people's degree of **trust** as well (e.g., Walklate, 1998). People might experience concerns about the loss of morality and cohesion in society or have concerns about their specific neighborhood, and use this information to make judgments about risk. As a consequence, a sense of insecurity and distrust in the environment might occur (e.g., Farrall et al., 2007; Skogan & Maxfield, 1981; Walklate, 1998; Warr, 1990). Instead, not experiencing any concerns and feeling a high sense of trust might underlie lower levels of fear.

Participants

1003 members of the Dutch general public (436 male, 563 female, 3 other, 1 missing value) with ages ranging from 18 to 89 years (M_{age} = 31.60, SD = 15.16) voluntarily participated in this photo vignette experiment. The questionnaire was distributed by Leiden university students as part of a course on research methods.[2] Students personally approached potential participants in their own social networks, and participants were asked to pass on the invitation to other candidates.

To further illustrate the composition of the sample: the majority of participants, namely 87.1%, reported themselves as being Dutch, 1.3% as Surinamese, 0.9% as Turkish, 1.5% as Moroccan, 1% as Indonesian, 0.6% as Antillean. 2.5% indicated to count themselves as having a nationality other than any of the aforementioned, and 5% counted themselves as having multiple nationalities. Furthermore, the majority of participants indicated that being a student (48.2%) or employee (37.4%) encompassed their daily activity. Other daily activities included being a high school student (2.9%), a job seeker (2.6%), housewife/husband (2.3%), pensioner (3.6%) or other (3%). The majority or participants did not experience victimization of violence (89.7%) or theft (73.8%) in the past 12 months.[3]

Materials and Procedure

Participants were instructed to complete the questionnaire quietly and individually. The participants were given written instructions informing them that the questionnaire was about emotions in daily life. They were further informed that there were no right or wrong answers, and that their answers would be treated confidentially. Participants were then randomly assigned to one of four conditions defined by a 2 (Context: photographic representation of alley vs. urban park) x 2 (CCTV: present vs. absent) between

2 Students only contributed to the distribution of the questionnaire, not to the original idea, concepts, design, operationalization, analysis, interpretation or writing.

3 There was one missing value on nationality, daily activity, and previous victimization of violence, and two missing values on previous victimization.

subjects design.

Independent variables. Participants were either provided with a photo of an alley or an urban park and were asked to imagine that they were currently in the situation depicted by the photo (these were photos with a Creative Commons license; see Appendix for the exact photos that were used). We chose to work with photo materials because the use of visual methods can make it easier for research participants to immerse themselves in the particulars of an (urban) situation under study (as compared to only textual description). As Rose (in reference to Wagner, 2007) argues, photographs have the ability "*to carry large amounts of information about 'how culture and social life looks ... that's difficult to represent in text alone*" (2012, p. 319). Harper (2002) also argues that the use of photo material elicits "*a different kind of information"* (p. 13) and can prompt research participants to better speak their emotions. Furthermore, participants either did (CCTV condition) or did not (no CCTV condition) read that: "*What cannot be seen in the photo is that there are also security cameras present at some distance from each other. These cameras are being watched live*."

Dependent variables. Participants were asked to rate how much fear, worry, happiness, anger, shame, guilt, sadness, awe, trust, and disgust they felt viewing the situation depicted on the photo, on rating scales running from 1 (*not at all*) to 7 (*very strongly*).[4] We further asked participants some demographic questions as already mentioned. As we are interested in people's emotional experience more generally, we chose not to specifically ask about people's emotions pertaining to (the threat of) crime. We acknowledge that this makes it more difficult to determine what specific aspect in the situation that is depicted by the photo triggers the emotion, beyond CCTV. It does yet enable us to investigate the diversity of emotions experienced in photographic representations of urban public spaces (under CCTV surveillance), which was our primary aim in the current study.

Analysis

In order to compare emotions *within* each of the four conditions, to test what the most dominant emotion experienced is, we performed paired samples *t*-tests. In order to compare emotions *between* conditions (in other words: to test for the influence of type of public space represented by the photo and presence or absence of CCTV surveillance), we performed a MANOVA and subsequent separate ANOVA's. The exact differences between the four conditions were analyzed via pairwise comparisons.

Results: Emotion Experience

All emotion means are displayed in Table 1.

Most dominant emotion experienced within each condition. See Figure 1 for an overview of results. Within the alley-CCTV condition, both fear and worry were the most dominant emotions experienced, with all *t*s > 9.24, *p*s < .001. Fear and worry were equally intensely experienced as the emotion ratings did not differ from each other, $t = 1.08$, $p = .282$. The same results were found in the alley-no CCTV condition, with , all *t*s > 8.87, *p*s < .001. Also in this condition, fear and worry were equally intensely experienced, $t = -1.18$, $p = .240$.

Within the park-CCTV condition, happiness and trust were the most dominant emotions experienced, with all *t*s > 4.87, *p*s < .001. Happiness and trust were equally intensely experienced as the emotion ratings did not differ from each other, $t = -1.72$, $p = .086$. Within the park- no CCTV condition, happiness was the most dominant emotion experienced, with all *t*s > 5.55, *p*s < .001.

Differences between conditions for each emotion. See Figure 2 for an overview of results.
A MANOVA with Context and CCTV as independent variables, and the emotion ratings as dependent variables was performed. This analysis first shows whether there are significant omnibus effects of the whole model, and then shows the effects for each dependent variable (in the current study: the different emotions) in separate ANOVA's.[5]

4 We also asked participants 1) to explain their emotion ratings in an open ended question, and 2) several questions with regard to (their chances of) becoming a victim. However, these results are not analyzed in detail here.

5 All main and interaction effects are reported. However, as main effects might be qualified by a significant interaction effect, the interpretation is then limited to the interaction effect only. Interaction effects occur when the effect of one variable depends on another variable (Tabachnick & Fidell, 2007).

Looking at the omnibus effects, we see a significant interaction effect, Wilks' Lambda = .95, $F(10, 950) = 5.12$, $p < .001$, $\eta_p^2 = .051$, and significant main effects for Context, Wilks' Lambda = .39, $F(10, 950) = 146.10$, $p < .001$, $\eta_p^2 = .606$, and for CCTV, Wilks' Lambda = .95, $F(10, 950) = 5.01$, $p < .001$, $\eta_p^2 = .051$. Below we describe the results from the separate ANOVA's for each emotion.

Fear. An ANOVA on fear revealed no Context x CCTV interaction, $F(1, 959) = 2.86$, $p = .091$, $\eta_p^2 = .003$, but did reveal a main effect of Context, $F(1, 959) = 781.67$, $p < .001$, $\eta_p^2 = .449$, and no main effect of CCTV, $F(1, 959) = 0.22$, $p = .640$, $\eta_p^2 = .000$. This means that participants experienced more fear in the alley than in the park, irrespective of the presence of CCTV.

Worry. An ANOVA on worry revealed a Context x CCTV interaction, $F(1, 959) = 13.22$, $p < .001$, $\eta_p^2 = .014$, a main effect of Context, $F(1, 959) = 560.29$, $p < .001$, $\eta_p^2 = .369$, but no main effect of CCTV, $F(1, 959) = 0.22$, $p = .398$, $\eta_p^2 = .001$. Participants experienced most worry in the alley-no CCTV condition, followed by the alley-CCTV condition, and the park-CCTV condition, with the least worry being experienced in the park-no CCTV condition. Hence, where worry is lower when CCTV is present in the alley, it is higher when CCTV is present in the park.

Happiness. An ANOVA on happiness revealed a Context x CCTV interaction, $F(1, 959) = 26.77$, $p < .001$, $\eta_p^2 = .027$, a main effect of Context, $F(1, 959) = 712.06$, $p < .001$, $\eta_p^2 = .426$, and a main effect of CCTV, $F(1, 959) = 22.77$, $p < .001$, $\eta_p^2 = .023$. This means that people's happiness experience in the alley and the park depends on the presence of CCTV. Participants experienced most happiness in the park-no CCTV condition, followed by the park-CCTV condition, and both the alley conditions. Put differently, happiness is experienced more intensely in the park than in the alley, but happiness is lower when the park includes the presence of CCTV.

Anger. An ANOVA on anger revealed a Context x CCTV interaction, $F(1, 959) = 9.76$, $p = .002$, $\eta_p^2 = .010$, a main effect of Context, $F(1, 959) = 59.09$, $p < .001$, $\eta_p^2 = .058$, and a main effect of CCTV, $F(1, 959) = 5.08$, $p = .024$, $\eta_p^2 = .005$. This means that people's anger experience in the alley and the park depends on the presence of CCTV. Participants experienced more anger in the alley conditions as compared to the park conditions. However, anger is higher when the park includes the presence of CCTV.

Shame. An ANOVA on shame revealed a Context x CCTV interaction, $F(1, 959) = 7.97$, $p = .005$, $\eta_p^2 = .008$, a main effect of Context, $F(1, 959) = 17.24$, $p < .001$, $\eta_p^2 = .018$, but no main effect of CCTV, $F(1, 959) = 0.02$, $p = .901$, $\eta_p^2 = .000$. This means that people's shame experience in the alley and the park depends on the presence of CCTV. Participants experienced most shame in the alley-no CCTV condition, followed by both the alley-CCTV and park-CCTV conditions, and least shame in the park-no CCTV condition. Where shame is lower when CCTV is present in the alley, it is higher when CCTV is present in the park.

Guilt. An ANOVA on guilt revealed no Context x CCTV interaction, $F(1, 959) = 1.48$, $p = .224$, $\eta_p^2 = .002$, but did reveal a main effect of Context, $F(1, 959) = 14.15$, $p < .001$, $\eta_p^2 = .015$, and no main effect of CCTV, $F(1, 959) = 0.05$, $p = .820$, $\eta_p^2 = .000$. This means that participants experienced more guilt in the alley than in the park, irrespective of the presence of CCTV.

Sadness. An ANOVA on sadness revealed no Context x CCTV interaction, $F(1, 959) = 1.88$, $p = .171$, $\eta_p^2 = .002$, but did reveal a main effect of Context, $F(1, 959) = 58.79$, $p < .001$, $\eta_p^2 = .058$, and no main effect of CCTV, $F(1, 959) = 0.31$, $p = .576$, $\eta_p^2 = .000$. This means that people's sadness experience in the alley and the park does not depend on the presence of CCTV. Participants experienced more sadness in the alley than in the park, irrespective of the presence of CCTV.

Awe. An ANOVA on awe revealed no Context x CCTV interaction, $F(1, 959) = 0.08$, $p = .778$, $\eta_p^2 = .000$, but did reveal a main effect of Context, $F(1, 959) = 41.82$, $p < .001$, $\eta_p^2 = .042$, and no main effect of CCTV, $F(1, 959) = 0.00$, $p = .963$, $\eta_p^2 = .000$. This means that people's awe experience in the alley and the park does not depend on the presence of CCTV. Participants experienced more awe in the park than in the alley, irrespective of the presence of CCTV.

Trust. An ANOVA on trust revealed a Context x CCTV interaction, $F(1, 959) = 4.45$, $p = .035$, $\eta_p^2 = .005$, a main effect of Context, $F(1, 959) = 351.85$, $p < .001$, $\eta_p^2 = .268$, but no main effect of CCTV, $F(1, 959) = 1.62$, $p = .203$, $\eta_p^2 = .002$. This means that people's trust experience in the alley and the park depends on the presence of CCTV. Participants experienced most trust in the park as compared to the alley conditions. However, in the context of the alley, trust ratings were higher when CCTV was present.

Disgust. An ANOVA on disgust revealed a Context x CCTV interaction, $F(1, 959) = 15.30$, $p < .001$, $\eta_p^2 = .016$, a main effect of Context, $F(1, 959) = 146.30$, $p < .001$, $\eta_p^2 = .132$, but no main effect of CCTV, $F(1, 959) = 0.02$, $p = .967$, $\eta_p^2 = .000$. This means that people's disgust experience in the alley and the park depends on the presence of CCTV. Participants experienced most disgust in the alley-no CCTV condition, followed by the alley-CCTV condition, and the park-CCTV condition, with the least disgust being experienced in the park-no CCTV condition. Hence, where disgust is lower when CCTV is present

in the alley, it is higher when CCTV is present in the park.[6]

Overall. In general, the current photo vignette experiment suggests that certain emotions shift as a function of CCTV presence; see Figure 3. CCTV generates lower worry, higher trust and lower disgust in a photographic representation of an alley. CCTV generates higher worry, lower happiness, higher anger and higher disgust in a photographic representation of a park.

Discussion

In the current exploratory, photo vignette experiment we aimed to investigate how the emotional experience in photographic representations of two specific urban public spaces is affected by the presence (or absence) of CCTV surveillance. In doing so, participants viewed photographic representations of two urban spaces that were assumed to differ in their emotional experience: an alley with graffiti at dusk versus a urban green space at daytime. We have looked at an array of emotions that might play a role in the experience of such urban public spaces, as put forward by the criminological, sociological, and psychological literature: the negative emotions fear, worry, anger, disgust, shame, guilt, and sadness, and the positive emotions trust, awe, and happiness. First, we have compared the relative degree to which the different emotions are experienced within each photographic representations of public space. Second, we have compared the emotional experience between the photographic representations of the urban public spaces, specifically looking at whether the description of CCTV surveillance being present or absent would influence the emotional experience as well.

One of the main findings is that participants generally experienced positive emotions more intensely in the photographic representation of the urban park, and negative emotions more intensely in the photographic representation of the alley. More specifically, and in line with previous research stressing the role of fear and worry in the experience of dark, confined, and disorderly urban public spaces, we indeed find that fear and worry are to a large extent experienced in the alley. However, our findings also illustrate that a sole focus on fear and worry does not suffice to understand the emotional experience of such a space. For example, anger and disgust closely follow the experience of fear and worry in the alley. These negative emotions seem almost absent in the photographic representation of the urban park. Results further show that it is not only the absence of negative emotions (such as fear and worry) that characterizes the urban park, but this situation also seems to elicit the experience of the emotions happiness, trust, and to a lesser extent awe. In general, the emotions shame and guilt are not intensely experienced in either the photographic representation of the alley or the urban park. As mentioned in the methodological section, shame and guilt can be experienced collectively when someone of the same group does something unjust or uncivil. From the depiction of the alley it was not clear who was responsible for the disorder, making it difficult to experience any shame or guilt in such a way.

A second idea that the current study built on was that management, surveillance, and policing interventions, that are initially aimed at reducing people's fear, may run the potentially unsolicited risk of influencing other emotions as well. In the elimination of fear to make a place more safe, an often used intervention is CCTV (e.g., Ceccato, 2020; Germain et al., 2013; Norris, 2012). In the current study then, we have also investigated how the presence of CCTV surveillance influences the emotional experience in both photographic representations of the urban public spaces. Adding CCTV in the alley did not alter the fear-experience: people still experienced fear to the same extent as people who were confronted with the alley without the presence of CCTV. The experience of worry and trust did differ: people experienced a lower degree of worry and a higher degree of trust (though not experienced intensely) in the alley when they knew CCTV was present versus when it was absent. From our findings it thus seems that in the alley worry, but not fear, is affected by CCTV. An explanation for this difference might be that the alley does not include an immediate threat (fear), but might trigger thoughts about future harm (worry) (Jackson & Gouseti, 2013), which is subsequently altered by the presence of CCTV surveillance. Based on these results, one could argue that CCTV might be considered a suitable instrument in urban public spaces that closely resemble the one depicted in our photo of the alley: while introducing CCTV significantly reduces the negative emotion worry (which it is also expected to do, taking into consideration the rationale behind its implementation) and increases trust, it does not negatively affect other, positive, emotions.

6 We also performed the MANOVA's with (separately) controlling for age, gender, and previous victimization (of violence or theft/destruction in the past 12 months). None of the initial Context x CCTV interaction and main effects changed.

Interestingly, the effect that the presence of CCTV has on the emotional experience in the photographic representation of the urban park almost works the other way around. That is, people experience more worry, anger, and disgust (though not experienced intensely) when they knew CCTV was present versus when it was absent in the urban park. Furthermore, the degree of happiness experienced in this situation is also significantly lower when people knew that CCTV was present versus when it was absent. One explanation for this could be that in a 'safe' environment such as an urban park in the current study (low on fear and worry), the presence of CCTV might signal that incidents have happened in the past and that people might need to be cautious. Research has shown that (increasing) security measures can actually raise concerns over safety (e.g., Brands & Van Aalst, 2017; Minton & Aked, 2013; Cook & Whowell, 2011; Hinkle & Weisburd, 2008; Koskela, 2012; Van de Veer et al., 2012). Indeed, "*symbols of security can remind us of our insecurities*" (Crawford et al., 2005, p. 53). Based on these results, one could argue that the suitability of the instrument in urban public spaces – that closely resemble the one of our urban park photo – could be questioned: instead of lowering fear and worry, these are increased. At the same time, more anger is experienced, and the positive emotion of happiness is negatively affected.

In general then, our results signal that CCTV might be a helpful intervention in reducing *worry* and increasing trust in an urban public space such as a dark, disorderly alley, but might also be counterproductive in surroundings that are generally considered enjoyable and carefree. This means that the implementation of CCTV takes careful thought. One could argue that including multiple emotions when measuring the effectiveness of the management, surveillance, and policing of urban public spaces enables a more nuanced way of evaluating their effects.

It should nonetheless be noted that CCTV surveillance is generally less present in urban parks to begin with, and hence people might view it as being more 'extreme' or even 'less approved' than in other situations. At the same time, headlines such as 'Cubbon Park CCTV cameras to curb thugs or hugs?' (Deccan Harald, 2018) illustrate that CCTV surveillance is increasingly becoming more commonplace in cities' green spaces. Popular media in the Netherlands (where the current study was situated) also report on CCTV surveillance in city parks of, for instance, Utrecht (DUIC, 2019), Amsterdam (Trouw, 2006) and Breda (BN DeStem, 2017). In a more general sense, Koskela even suggests: "*Electronic means are beginning to replace informal social control in urban environments: the eyes of the people on the street are being replaced by the eyes of surveillance cameras*" (2000, p. 244).

This connects to another interpretation of the differential effects we found for the presence of CCTV between the photographic representations of the alley and urban park contexts: urban public spaces such as parks provide opportunities for social interactions, thereby promoting social cohesion (Peters et al., 2010). Hence, people might be more inclined to rely on informal social control in urban public parks, explaining the higher levels of trust and happiness in the current study. Negative emotions towards surveillance might therefore also be more likely in environments where social control 'flourishes', as people might see surveillance as an 'interrogation'. In cases where this informal social control is less present – such as in an alley – people might be more open to alternative forms of control such as CCTV surveillance. Put differently, the absence of informal social control might cause a demand for more formal social control (Van den Broeck, 2012). From the current study we are not be able to conclude whether or not CCTV is 'approved' more in particular urban contexts, or whether there is indeed a certain interplay between perceptions of informal and formal social control underlying the results: measures for 'approval' of CCTV and social control were not included in the current experiment. Interpreting our main results, we would argue this to be an interesting avenue for further research. The study does clearly show that the emotional experience in photographic representations of certain urban public spaces might shift as a function of CCTV presence.

Limitations and recommendations for future research

A few limitations of the current study should be noted. Firstly, the questionnaires were distributed by university students as part of a course on research methods. This strategy helped us to gather a large and diverse group of participants. Still, although students received clear instructions about how to collect the data, and let the research participants sign an informed consent, we were not able to fully monitor the data collection as closely as we would have if we had conducted the questionnaires ourselves. Secondly, the CCTV condition did not actually *depict* the presence of a CCTV camera being watched live, neither did it include a manipulation check of CCTV presence. It would have benefitted the study if we could be sure

that participants had read about the CCTV presence.

The current study was designed as an experiment in which the photographic representations of two specific public spaces were compared. While there are clear benefits to such a clean design, for example to be able to test for causality, it also limits the generalizability of the results to other (photographic representations of) urban public spaces. For example, one could argue that our experiment contains two contexts that are on the extreme sides of a 'safe/unsafe' spectrum. As a consequence, places regarded as 'unsafe' might 'demand' CCTV more. Hence, it could be argued that the experiment would have benefitted from the inclusion of a more 'neutral' context which is not very safe or unsafe and in which people expect CCTV surveillance to be present, such as an inner city town square. Still, we deliberately chose the current (extreme) contexts to allow for the detection of a shift in people's emotional palette. It would hence be interesting to further explore the varied emotional experience of a greater variety of public spaces than we have included, and how it is affected by CCTV surveillance.

Another avenue in this regard might be to more directly compare contexts during day- and nighttime. While we explicitly chose for photographic representations of a nighttime alley and a daytime urban park in order to, respectively, maximize and minimize the 'warning signals' (cf. Innes, 2004) people might experience, a downside is that we cannot clearly distinguish between this and other contextual factors bound to the depicted situations. In other words, the urban park might (also) have been experienced more positively than the alley, because it was depicted during daytime (parks can also elicit a fear of crime if deserted, especially at night, see Maruthaveeran & Van den Bosch, 2014). Hence, it would be interesting to see whether the emotional experience of urban public spaces shifts as a function of day- and nighttime.

More generally speaking, there is a large variety of factors in urban public spaces, besides CCTV presence, that could influence people's emotional experience. However, as we wanted to be able to single out the potential influence of CCTV specifically – keeping other factors in the urban public space constant – an experimental design is the most suitable option. Furthermore, our study was aimed at looking whether the emotional experience of photographic representations of urban public spaces is different at all, not so much at which factors contribute to that emotional experience. If one is interested in the latter, an experiment is a less suitable design. This would be an interesting avenue for future research though.

Finally, the current study took place in the Dutch context which means that the meaning of specific emotions might not necessarily be the same for people from other countries or cultures. The frequency, intensity, and expression of emotions can be culturally shaped (e.g., Mesquita, 2022). It would therefore be an interesting avenue for future research to take a cross-cultural perspective on the emotional experience of urban public spaces, including the role CCTV surveillance.

Conclusion

In the current photo vignette experiment we have demonstrated that the emotional experience of photographic representations of urban public spaces includes a diverse palette of emotions. We have further demonstrated that the inclusion of CCTV as an intervention might work well in an alley, but might cause an unsolicited risk of influencing other emotions in a negative sense (a lower level of happiness and higher level of worry) in surroundings that are generally considered enjoyable and carefree such as an urban park. The multifaceted emotional experience of urban public spaces signals an opportunity for safety interventions to not (solely) focus on eliminating negative emotions, but also on accounting for positive emotions.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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Appendix

Tables

Table 1. *Emotion Means (and Standard Deviations) as a Function of Condition.*

	Alley		**Park**	
	CCTV	**No CCTV**	**CCTV**	**No CCTV**
Fear	**3.90 (1.56)**$_{a}$	**4.01 (1.51)**$_{a}$	1.68 (1.10)$_{b}$	1.50 (0.95)$_{b}$
Worry	**3.84 (1.56)**$_{a}$	**4.09 (1.53)**$_{b}$	2.03 (1.39)$_{c}$	1.63 (1.05)$_{d}$
Happiness	1.88 (1.18)$_{a}$	1.85 (1.16)$_{a}$	**3.82 (1.77)**$_{b}$	**4.72 (1.43)**$_{c}$
Anger	2.14 (1.46)$_{a}$	2.21 (1.38)$_{a}$	1.76 (1.34)$_{b}$	1.32 (0.78)$_{c}$
Shame	1.67 (1.17)$_{a}$	1.89 (1.37)$_{b}$	1.57 (1.07)$_{ac}$	1.37 (0.90)$_{c}$
Guilt	1.55 (1.04)$_{a}$	1.64 (1.17)$_{a}$	1.39 (0.91)$_{b}$	1.32 (0.79)$_{b}$
Sadness	1.98 (1.40)$_{a}$	2.14 (1.53)$_{a}$	1.47 (1.07)$_{b}$	1.40 (0.91)$_{b}$
Awe	2.38 (1.55)$_{a}$	2.35 (1.49)$_{a}$	3.02 (1.71)$_{b}$	3.05 (1.68)$_{b}$
Trust	2.38 (1.40)$_{a}$	2.05 (1.33)$_{b}$	**4.03 (1.68)**$_{c}$	4.12 (1.72)$_{c}$
Disgust	2.57 (1.71)$_{a}$	2.95 (1.78)$_{b}$	1.78 (1.39)$_{c}$	1.39 (0.96)$_{d}$

Note. Emotions could range from 1 (not at all) to 7 (very strongly). Means with a different subscript differ significantly from each other between conditions (horizontal), with all *p*s < .046 (pairwise comparisons). Means in bold represent the dominant emotion experienced within that condition (vertical), with all *t*s > 9.24, *p*s < .001 in the alley-CCTV condition, all *t*s > 8.87, *p*s < .001 in the alley-no CCTV condition, all *t*s > 4.87, *p*s < .001 in the park-CCTV condition, and all *t*s > 5.55, *p*s < .001 in the park-no CCTV condition (paired-samples *t*-tests).

Figures

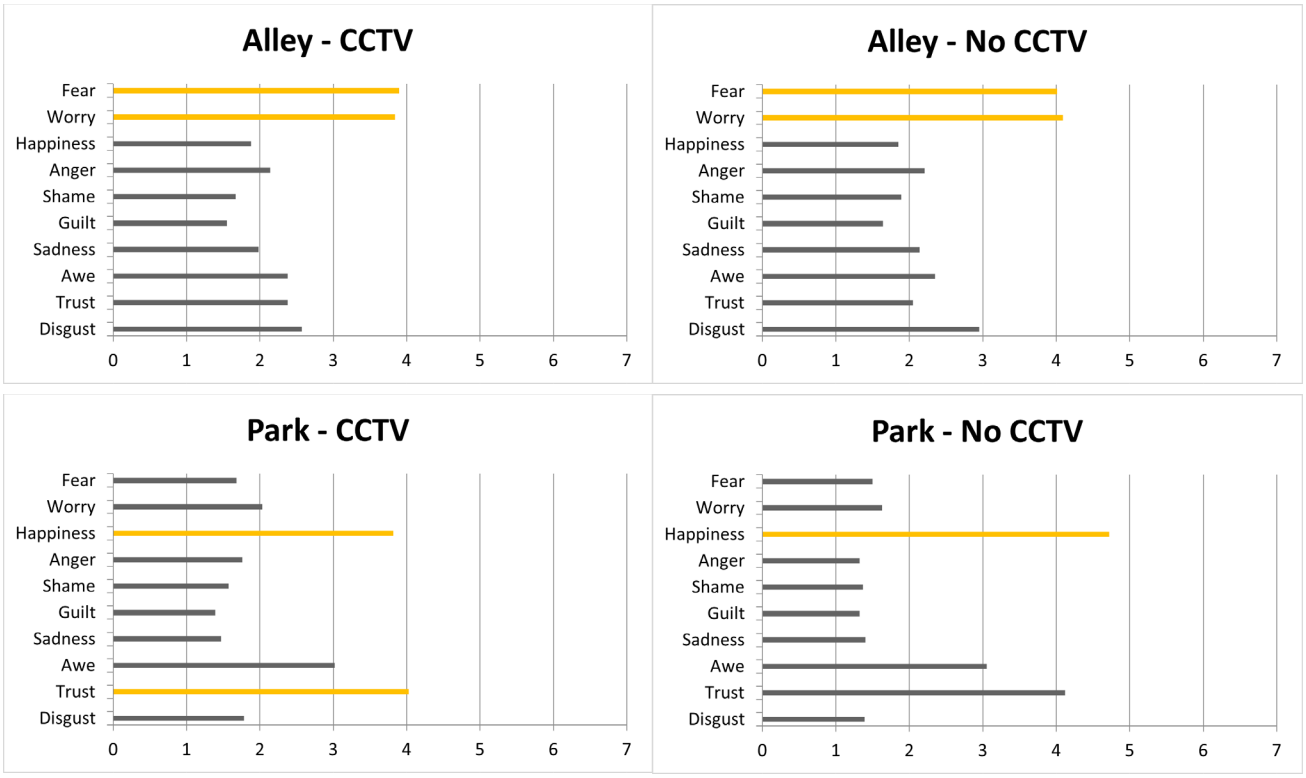

Figure 1. Emotions experienced (on a scale of 1-7) within each condition. The yellow lines represent the most dominant emotion(s) experienced.

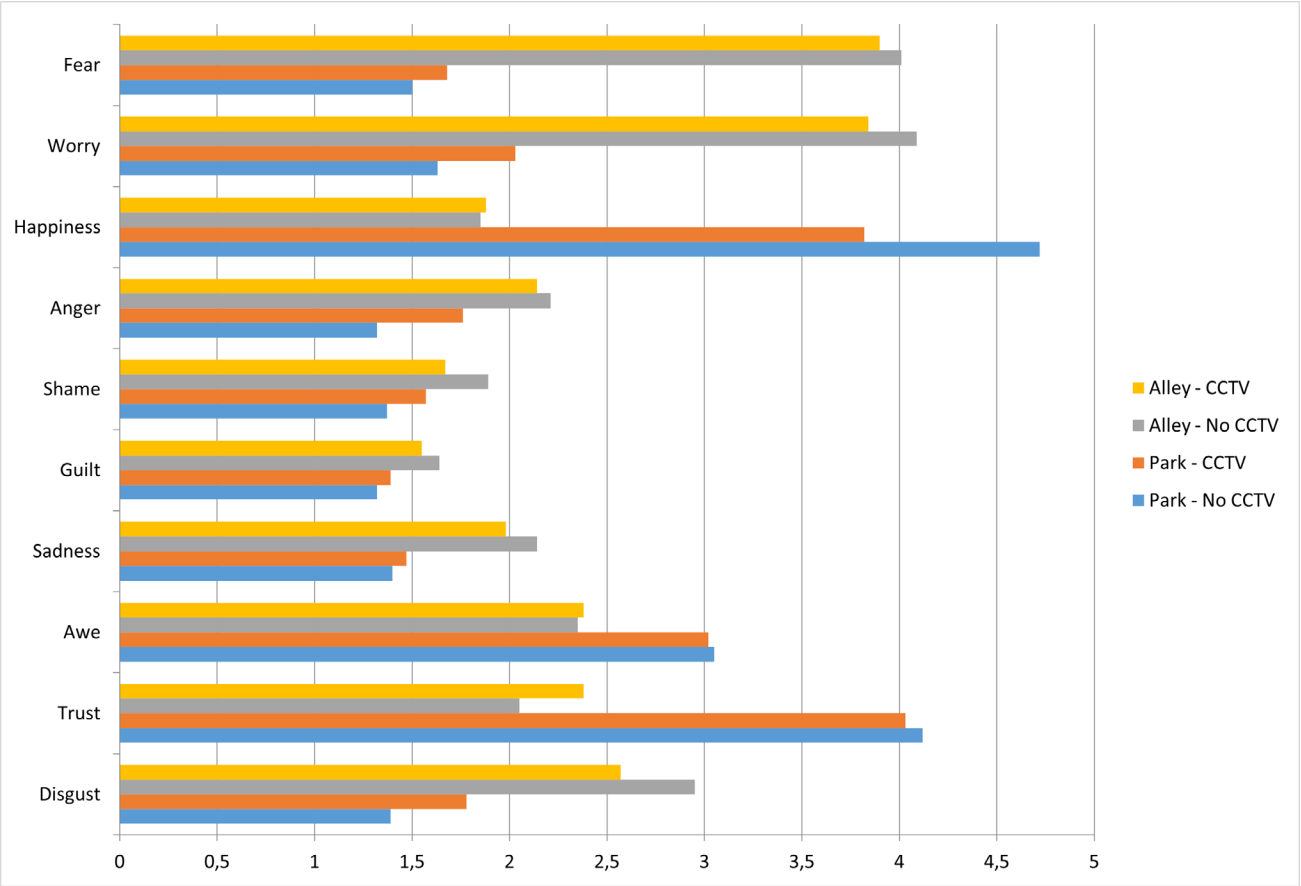

Figure 2. Emotions experienced (on a scale of 1-7), compared between conditions.

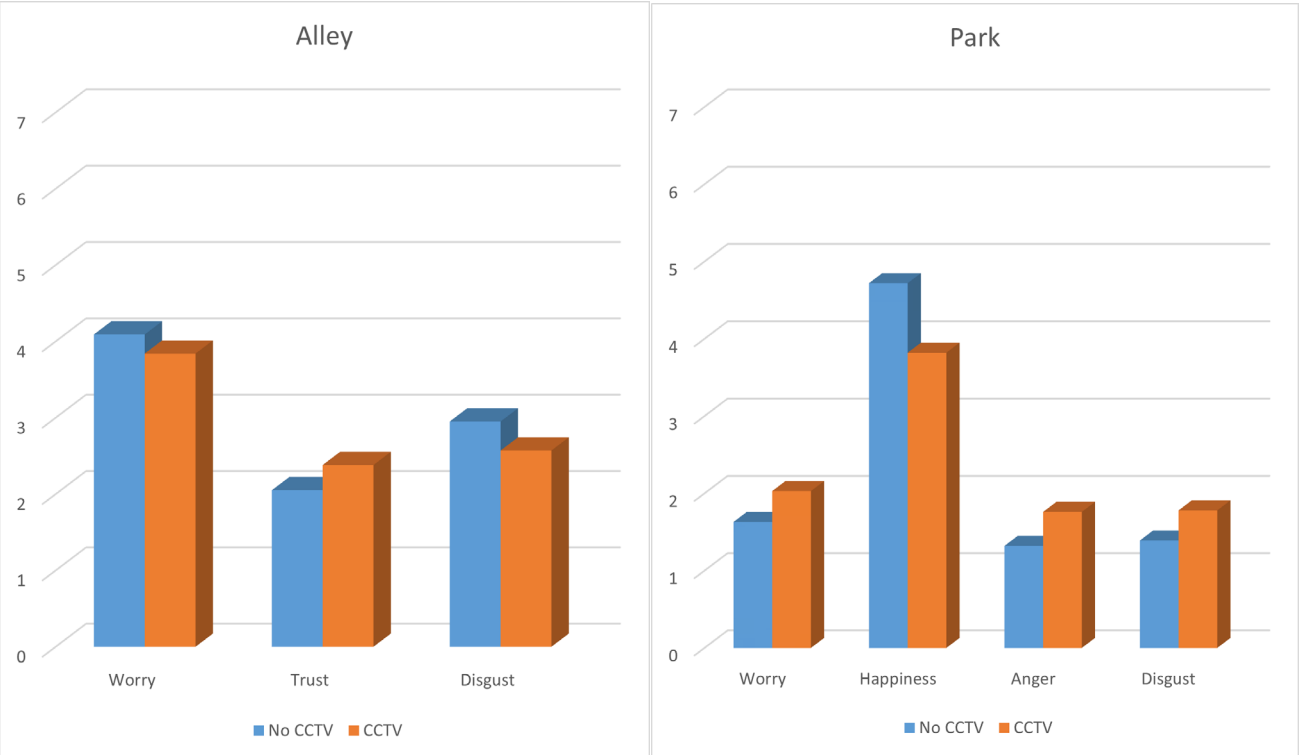

Figure 3. Statistically significant shifts in emotions experienced (on a scale of 1-7) as a function of CCTV presence in photo representation of an alley and a park.

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How to cite this article (APA– 7th ed.):
Van Doorn, J. & Brands, J. (2023). Mixed emotional experience in photographic representations of urban public spaces with CCTV surveillance: A photo vignette experiment. *Criminological Encounters*. 6(1). 48-65. https://doi.org/10.26395/CE.2023.1.05

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