

## Personality and Social Psychology

# Atmosphere in an urban nightlife setting: A case study of the relationship between the socio-physical context and aggressive behavior

INDRĖ KALINAUSKAITĖ,  ANTAL HAANS, YVONNE A. W. DE KORT and WIJNAND A. IJSSELSTEIJN

*Eindhoven University of Technology, Eindhoven, the Netherlands*

Kalinauskaitė, I., Haans, A., de Kort, Y. A. W. & Ijsselsteijn, W. A. (2018). Atmosphere in an urban nightlife setting: A case study of the relationship between the socio-physical context and aggressive behavior. *Scandinavian Journal of Psychology*.

Aggression is strongly influenced by the surrounding socio-physical context, and the development of aggressive behavior is best understood through a continuous cycle of ongoing person-environment interactions. Empirical studies, nevertheless, have been predominantly conducted in the laboratory, studying aggression as a short-lived phenomenon, emerging from and within an individual, and – with situational factors studied in isolation – devoid of its context. The present field study, conducted in an urban nightlife area, complements this research. A qualitative, multi-method approach was followed by thematic analysis to investigate ongoing behavioral patterns of the crowd *vis-à-vis* the changes in the context that co-occurred with the development of unwanted behaviors, including aggression. In our study, we identified atmosphere as a dynamic and mood-like, but extra-individual state of the socio-physical setting related to the development of aggression. Our results suggest that atmosphere affects the behavior of groups and individuals by emerging from and feeding into ongoing interactions between people and the environment. At the individual level, it appears to play its part as proximate determinant of behavior; at the crowd level it reflects the synergetic product of all those persons' states, behaviors and interactions. Implications for aggression theory and for applications aimed at curbing aggression are discussed.

**Key words:** Atmosphere, aggression, socio-physical context, urban nightlife, people-environment interaction, field study.

*Indrė Kalinauskaitė, Human Technology Interaction Group, IPO 0.22, PO Box 513, 5600MB Eindhoven, the Netherlands. E-mail: i.kalinauskaite@tue.nl*

## INTRODUCTION

Human aggression is a topic of great societal relevance and continued scientific interest. According to Goldstein (1994), every act of aggression is a cycle of person-environment interactions. Yet, while the importance of the physical and social environment in the etiology of aggression is acknowledged in all of today's influential theoretical models (e.g., General Aggression Model; Anderson & Bushman, 2002), literature reveals that aggression is often studied as a momentary and short-lived phenomenon, emerging from and within an individual and relatively devoid of its context (Goldstein, 1994). So today we know quite a lot about isolated factors (e.g., variations in mood, the presence of aggressive cues/objects, self-regulation, behavioral norms) and their influence on aggressive behavior from laboratory studies (e.g., Baron & Bell, 1976; Berkowitz & LePage, 1967; DeWall, Baumeister, Stillman & Gailliot, 2007; Locke & Mahalik, 2005), but we lack knowledge on the relative importance and interplay of such factors in real-life situations. At the same time there are studies statistically relating crime or aggression to environmental characteristics such as the amount of green (e.g., Kuo & Sullivan, 2001; Kimpton, Corcoran & Wickes, 2016), outdoor lighting (e.g., Welsh & Farrington, 2008), or crowd size (Russell, 1983) based on archival data, but these cannot provide thorough insight on the process of emergence of aggression.

According to ecological psychologists, socio-physical characteristics of environments coerce behavior in dynamic but patterned, and thus predictable ways (Barker, 1968). Because aggression is a behavior strongly dependent on context, laboratory studies need to be complemented with naturalistic field research to expand our understanding of how it emerges and develops in

specific environments, and, thus, of how it may be curbed effectively. To paraphrase Wicker (1979), while controlled laboratory aggression studies reveal how people could behave given the conditions imposed by the experimenters, they are not suitable to reveal how people actually do behave in naturalistic environments and realistic situations. What is needed is not just more field research, but an approach that considers the context in which aggression occurs in a more holistic fashion – the environment not as a conglomeration of isolated stimuli and events, but as the ecological backdrop against which aggression is to be understood. In the present study we describe field research investigating the social and physical context of ongoing aggression and its influence on people's behavior in an urban nightlife area. Instead of studying aggressive incidents as momentary, short-lived and relatively isolated phenomena, emerging from and within an individual aggressor, the current research takes a holistic perspective on the socio-physical context and how it develops over time. We did not focus on isolated incidences of aggression, but instead observed and investigated ongoing patterns of behavior of a crowd, in its naturalistic environment, and explored changes in the socio-physical environment that co-occurred with the rise and fall of aggression.

### *General Aggression Model*

Human aggression is typically defined as “any behavior directed toward another individual that is carried out with the proximate (immediate) intent to cause harm” (Anderson & Bushman, 2002, p. 28). It includes a range of behaviors that vary in severity (e.g., honking behavior while driving vs. domestic violence) and can be passive or active. This includes physical and verbal behaviors,

affective, impulsive (mainly ruled by emotions) and instrumental, well-thought-out acts of aggression (Anderson & Carnagey, 2004). In the General Aggression Model (GAM; Anderson, Deuser & DeNeve, 1995), as well as in most other social-cognitive models, aggression results from the way in which environmental (or situational) stimuli and person factors (e.g., traits, attitudes) influence an individual's internal state (i.e., affect, arousal and cognitions). This internal state influences appraisal and decision-making processes, which, in turn, determine subsequent actions (e.g., aggressive behavior). Thus, in the GAM, behavior is shaped through a series of interactions – called “episodes” – between a person and his or her immediate environment.

There is a substantial body of research supporting the notion that environmental conditions have an effect on aggression, including, for example, the presence of aggressive cues (Berkowitz, 1964; Bartholow, Anderson, Carnagey & Benjamin, 2005; Carlson, Marcus-Newhall & Miller, 1990), provocations, or unpleasant environmental circumstances such as noise (Donnerstein & Wilson, 1976; Geen, 1978; Geen & O'Neal, 1969) and temperature (Anderson, 2001; Anderson, Deuser & DeNeve, 1995). Crowding too has been linked to aggressive behavior (Altman, 1975; Macintyre & Homel, 1997). It affects perceptions of physical space and social behavior (Baum & Greenberg, 1975; Baum & Koman, 1976), provides people with anonymity and deindividuation (Prentice-Dunn & Rogers, 1980; Reimann & Zimbardo, 2011), and can thus increase the likelihood of asocial or other deviant behaviors.

The GAM has proven effective in explaining the underlying psychological mechanisms behind human aggression, and in providing solid foundations for understanding the contextual influences on aggression. However, research that focuses on these contextual influences has been predominantly conducted in controlled laboratory settings, and the large majority of studies to date have investigated environmental factors as isolated stimuli. To our knowledge only a few studies have investigated aggression in its naturalistic context, and from a more holistic perspective (e.g., Farrell, Mays, Bettencourt, Erwin, Vulin-Reynolds & Allison, 2010; Graham, West & Wells, 2000; Homel, Tomsen & Thommeny, 1992). Especially relevant for our work is the research conducted by Graham and colleagues, who, based on an impressive series of field studies investigating alcohol related aggression, were able to show the prominent influence of personal (e.g., “machistic” attitudes) and situational factors (e.g., a permissive bar environment, noise, crowding, messiness of the space) on the frequency and/or severity of aggressive behavior in bars (Graham, Bernards, Osgood & Wells, 2006; Graham, Osgood, Zibrowski *et al.*, 2004; Graham & Wells, 2003). This body of work included qualitative observations and retrospective interviews or surveys, as well as more structured observations quantifying both the number of incidents and the situational characteristics of bars where such incidents were fairly common. The studies reflect and illustrate the relevance of the components of the GAM for real-world aggression and provide us with valuable insights in situational elements that may predict the frequency or severity of aggressive incidents. But although this was research performed in a naturalistic setting, their focus was still on aggressive incidents per se, as discrete episodes within the ongoing stream of person-environment interactions. They, hence, do not explain how such discrete, small-scale interactions are tied

to the larger socio-physical or temporal context of crowds in large-scale public environments. The cyclical structure of GAM suggests that every episode of human behavior is preceded and succeeded by another, not necessarily aggressive, episode of human behavior. This implies that to understand how aggression develops, we should study aggression over time, equally focusing on both positive and negative interactions. Relevant in this respect is the work on the ecology of aggression by Goldstein (1994).

### *Ecology of aggression*

In ‘The ecology of aggression’ Goldstein (1994) investigates human aggression through the prism of interactionism. Goldstein's argument (see also 1997) is that neither the individual, nor the social and physical environment can be held independently accountable for acts of aggression, but that aggression emerges from the reciprocal influence that individuals and environment exert on each other through what he labeled the “person-environment duet” (Goldstein, 1994, p. 3). This “duet” denotes interaction, a process where behavior, personal characteristics and environmental influences, all act as reciprocal determinants of each other (Bandura, 1978). Although Goldstein propagated that anti-social behaviors can be understood only from studying person and environment interactions in a holistic manner, there is, to our knowledge, no empirical research that has specifically addressed how dynamic and site-specific interactions between an individual and the socio-physical environment influence aggressive behavior. In other words, we still know little about how the person-environment duet is actually being sung.

Guidance to answering such question may be found in ecological psychology (Barker, 1968; Wicker, 1979). Since people share common behavioral attributes, person-environment interactions will first most reveal themselves in extra-individual patterns of behavior. This, however, requires that research on aggression in naturalistic settings focuses not only on investigating individual persons, but on investigating the behavior of inhabitants of a place as crowd as a whole.

### *Research aims*

The goal of the present study was to add to our theoretical and practical understanding of the development of aggression by studying the dynamics of the interaction between people and their socio-physical environment in a real life context – Stratumseind: a night life area in the city of Eindhoven, the Netherlands. We aim to explore how the contextual influences on aggressive behavior can be recognized and described. Our focus lies not on acts of organized, premeditated and/or instrumental aggression – although of course this may not always be obvious from observations – but on unplanned, reactive aggression emerging in otherwise neutral or friendly crowds (e.g., harsh interactions between people, or frustration-induced pushes and verbalizations). Our research was driven by the following questions: How does aggression in larger groups emerge and unfold over time? How do changes in the socio-physical environment make aggression more or less likely?

To answer these questions, we employed qualitative methods ranging from interviews to on-site observations, and involved multiple user groups. In contrast to previous naturalistic field

studies (e.g., Graham, West & Wells, 2000), we did not investigate isolated incidences of aggression and escalation, and avoided studying single individuals or specific subgroups of the community (e.g., African-Americans; McMahon, Todd, Martinez *et al.*, 2013; Romero, Richards, Harrison, Garbarino, Mozley, 2015). Instead, we investigated people-environment interactions at the crowd level, and tried to capture both positive and negative behavioral patterns as well as their dynamic transitions over time.

### THE STRATUMSEIND CASE

Stratumseind is a pedestrian area, approximately 350 meters long, located in the heart of the city of Eindhoven. It accommodates over 50 different bars and sees over 40,000 visitors during the busiest weekend nights, Thursday through Saturday. Stratumseind itself has only a few residents. During the day most of the bars are closed, terraces are empty, and the street almost looks deserted; a marked contrast to the weekend's evenings and nights. Stratumseind thus is a city area with a clearly demarcated function, dedicated for nightlife. However, besides the festive and generally positive vibe on the street, one also observes intoxication, noise and a range of inappropriate behaviors. In recent years, the area has seen an increase in incidents reported by the police. Thus, a better understanding of how aggressive behavior evolves in and is contextually defined at Stratumseind is not only of interest from a theoretical perspective, but may point to novel ways for the municipality and other stakeholders to curb recent trends and improve the Stratumseind experience for its visitors and inhabitants.

### METHODS

To reveal the social dynamics on Stratumseind, we employed a qualitative approach (similar to van der Leun & Koemans, 2013) using multiple data collection strategies to ensure that our study included not only our personal – yet “outsider” – observations, but also reflected the perspectives and first-hand experiences of the people visiting Stratumseind, as well as those working there.

#### *Observations*

Unstructured observations were performed by the first author and an assistant. Notes were taken about the Stratumseind environment (e.g., artifacts, crowdedness, weather, noise), interactions of visitors with their physical environment (e.g., how individuals interact with the objects in/on their way), and interactions between people (e.g., how individuals move along the street, how they pull at others, push them, flirt, etc.). In addition, observers noted their subjective evaluation of the overall mood of the street and personal experiences coming from accidental (e.g., while walking through Stratumseind) or purposeful (e.g., during interviews) interactions with the crowd. Since the nature of our observations was explorative and qualitative – in contrast to more structured observations – it did not allow for the measurement of inter-observer reliability. The field notes of the two observers were merged. However, any discrepancies were discussed (which happened only infrequently).

The observations were performed throughout two full weekends in June and July, 2014, on all three going-out nights – Thursday, Friday and Saturday – between 10 PM and 5 AM (3 AM on Thursdays), covering in total almost 40 hours of observation. In the selection of these observation weekends, we excluded days of national celebrations or holidays that would interfere with ‘regular’ life on Stratumseind. During our data collection period no national holidays or celebrations took place. During the observation period, two days included three special events: two Dutch football games in World Cup 2014 (relatively large-scale) and a thematic street party (relatively small scale). Special events like these occur frequently on Stratumseind, and thus these were regarded as regular evenings. Observations were made along the full length of Stratumseind, controlling for the time spent in each part of the street. By the end of each night each observer made a summary of the happenings throughout the night, concisely describing the evening and major incidents.

#### *Police data*

Police data consisted of reports by the Eindhoven Police department's Horeca Team of each night during which researchers performed the observations. These reports included evaluations of the evening, descriptions of specific environmental characteristics (artifacts, crowding level, and weather conditions), events/happenings, and both numbers and concise descriptions of formal reports to the central police unit and the number of arrests that night. The data relevant for this study were extracted from the reports, summarized and anonymized.

#### *Interview with police*

In addition to police reports, a semi-structured interview was performed with the Horeca Team Manager, a police officer in charge of the team of police agents patrolling on the streets of Eindhoven centrum during weekend nights. This person works on Stratumseind almost every weekend, three consecutive nights in a row. His expertise provided us with rich insights on the police work on Stratumseind, and the actions taken against aggression and escalation.

#### *Interviews with bar owners and security staff*

Five semi-structured interviews were performed with Stratumseind bar owners, and three with security staff. They provided us with their perspective on Stratumseind, the visitors of their bars, outlined problems with aggression/escalation, and how this is usually handled in their businesses.

#### *User interviews I: in-situ reflections weekend 1 and weekend 2*

We performed in-situ user interviews in two phases. In phase 1, 51 persons (29 male, 22 female) agreed to participate in brief (2–3 minutes) interviews during the first observation weekend (12–14 June 2014). The average age of interviewees was 22 years (SD = 4; range 15 to 37). During these structured interviews we asked participants about their overall experience on Stratumseind.

For phase 2, 44 people (26 male, 18 female) agreed to participate in brief (1–2 minutes) interviews on Stratumseind during the second observation weekend (3–5 July 2014). The average age of interviewees was 24 years ( $SD = 5$ ; range 17 to 37). During this second series of structured interviews we asked people about their current, in-the-moment experiences. We probed their mood and their experience of the evening on the street, and whether they had seen or experienced annoying, aggressive or escalated behavior that evening.

#### *User interviews II: retrospective interviews – photo studies*

Ten participants, five males and five females with an average age of 27 years ( $SD = 4$ ; range 23 and 37), participated in off-site photo-supported interviews. Five of them were students; one was a recent graduate doing an optional internship with a company, and four participants were working. All participants were recruited via the social network of the first author. None of the participants were friends or close acquaintances.

Participants were interviewed using a semi-structured interview script. As support material, participants were presented with photo and/or video materials showing the life on Stratumseind at particular party nights (see examples in Fig. 1). This included people's behavior, artifacts, noises, etc. In these interviews, we mainly focused on people's view on Stratumseind as a going-out location, reasons for selecting it over other locations, interactions they observed and experienced, whether they had ever experienced aggression there and, if yes, why they thought this happened. In addition, they were asked to describe the prototypical Stratumseind visitor(s).

#### *Data analysis*

Data was analyzed by means of thematic analysis using the Thematic Networks technique (Attride-Stirling, 2001). We first derived the lowest order basic themes for each data source separately (107 basic themes in total). These basic themes summarize the core notions present in the data. Second, basic themes discussing similar issues were, again for each data source separately, clustered into middle order organizing themes (31 in total). Finally, the organizing themes from all data sources (i.e., observations, interviews) were pooled and global themes were extracted (11 in total). Four of the organizing themes were used to derive more than one global theme (three organizing themes appeared in two global themes each, and one – in three global themes). Global themes are the highest order themes and contain the core analytical insights that the data support.

For reasons of readability and fluency, we do not present the reader with lower order basic and organizing themes in the results section. Instead, we provide a narrative account based on global themes illustrated with quotations and observation notes to support our findings. However, to provide an overview, we present the global themes and the organizing themes on which they were based in Table 1.

## RESULTS

### *Urban areas devoted for nightlife, such as Stratumseind, can create different socio-physical contexts by hosting multiple user groups over time and in different locations*

Stratumseind's role as one of the central going-out areas of Eindhoven is well known throughout the Netherlands. The high concentration of different bars is one of the main reasons why



Figure 1. Examples of the images of Stratumseind used in the retrospective user interviews (User interviews II).

Table 1. Overview of Global and Organizing themes from different data sources used and reported in present study

Global theme	Organizing themes from different sources
Urban areas devoted for nightlife, such as Stratumseind, can consist of different socio-physical contexts by hosting multiple user groups over time and in different locations	Bars in Stratumseind attract a diverse crowd, which distributes unevenly throughout the street Saturdays are the busiest nights on Stratumseind with the crowd being least homogenous (where they come from, what they know about Stratumseind, etc.), while Thursdays are mainly student nights and Friday is the evening for locals The crowd of Stratumseind is diverse in their educational and cultural backgrounds, is usually different during each going out night and is mostly consisting of young people People choose Stratumseind, because they know that if they don't find something they like in one place, they can quickly change to another bar
Atmosphere is a snapshot of the current socio-physical context and it can be sensed by individuals present in a place, regardless of their role	People's interactions with environment and each other reveal their moods and feelings, which create an atmosphere that can be evaluated by those present on Stratumseind Atmosphere is observed through people's movements and behaviors and on Stratumseind it tells how people will behave, interact, react Atmosphere is influenced by individual contributions - such as moods of the visitors
External factors, such as crowdedness of the environment, social happenings or important sports games, can significantly affect the atmosphere	Crowding can create chaos, lack of order and control, it also influences people's movement, behavior and choices to stay in particular place The external happenings and events influence people's behavior, decision making, mood and alcohol consumption Atmosphere is influenced by social & environmental factors (e.g., crowding, special events) Crowding can cause discomfort & frustrations Stratumseind as a street is not only a street to walk by and/or change destinations, but it is as well as a socializing environment, which sometimes can get very crowded
Atmosphere is a dynamic phenomenon, which subtly fluctuates throughout the course of the night	As time goes by, atmosphere may change and vary (as do the behaviors, demographics of the crowd, etc.) Socio-physical and social norms influences people's behavior, interactions with each other and towards their environment (e.g., litter or presence of the police) Atmosphere is observed through people's movements and behaviors and on Stratumseind it tells how people will behave, interact, react
Atmosphere foreshadows the likelihood of aggressive behavior	Atmosphere is observed through people's movements and behaviors and on Stratumseind it tells how people will behave, interact, react
Alcohol intake deteriorates the quality and increases the quantity of social interactions and thus increases the likelihood of intentional and unintentional asocial behavior	Alcohol influences people's behavior and interactions with each other in various ways (e.g., it seems to increase social interactions, which at times may result in aggressive or unfriendly behavior) Socio-physical and social norms influences people's behavior, interactions with each other and towards their environment (e.g., litter or presence of the police)
Aggression on Stratumseind is alcohol related, but often not directly caused by alcohol abuse	Alcohol in combination with high arousal and other psychological and biological factors (e.g., frustration, testosterone or adrenaline levels), contribute to escalated and aggressive behavior Men belonging to closed social groups, cultural minorities and of a younger age are most commonly observed as aggressors on Stratumseind, but there are various other influences that may cause anyone to aggress (e.g., bad day, relationship issues) Aggression is influenced by frustrations, affect, personality, cultural background and alcohol Different experiences, frustrations and affect, together with an influence of alcohol, can cause social interactions to escalate or even become aggressive
Unfamiliarity with a place and behavioral norms and high densities of people belonging to different social groups increase the likelihood of asocial, or even aggressive behaviors	One of the tactics to fight aggression is very salient (yellow bright jackets) and enhanced (distributed) police presence on throughout the street Peer pressure & salience of social norms have a big influence on people's behavior on Stratumseind Men belonging to closed social groups, cultural minorities and of a younger age are most commonly observed as aggressors on Stratumseind, but there are various other influences that may cause anyone to aggress (e.g., bad day, relationship issues) Social norms and social control have a great influence on people's behavior and perception of the environment Stratumseind visitors prefer a number of bars where they know the crowd will be familiar to them
Unfamiliarity with a place and behavioral norms and high densities of people belonging to different social groups increase the likelihood of asocial, or even aggressive behaviors	One of the tactics to fight aggression is very salient (yellow bright jackets) and enhanced (distributed) police presence on throughout the street Peer pressure & salience of social norms have a big influence on people's behavior on Stratumseind Men belonging to closed social groups, cultural minorities and of a younger age are most commonly observed as aggressors on Stratumseind, but there are various other influences that may cause anyone to aggress (e.g., bad day, relationship issues) Social norms and social control have a great influence on people's behavior and perception of the environment Stratumseind visitors prefer a number of bars where they know the crowd will be familiar to them
Crowding increases the likelihood of aggressive behavior	Crowding is unsafe, can disturb police and other institutions work and can cause frustrations & annoyance in the crowd, leading to escalated behaviors Crowding can cause discomfort & frustrations

(continued)

Table 1 (continued)

Global theme	Organizing themes from different sources
Small groups of young males with “macho” attitudes are more likely to be aggressive	Second part of the street attracts certain types of visitors, which cause problems Men belonging to closed social groups, cultural minorities and of a younger age are most commonly observed as aggressors on Stratumseind, but there are various other influences that may cause anyone to aggress (e.g., bad day, relationship issues) Aggression mostly happens amongst male visitors Some men flirt or hit on the girls in annoying, inappropriate ways Because of the different bars and locations where they are placed, Stratumseind crowd has specific groups - some residing more in the front of the street, the others - in the back
Incidents of aggression, as reported in the police reports, do not reflect what aggression is or how it is experienced by visitors	No observations of aggressive incidents Police reports indicate a number of aggressive/violent incidents Aggression is expected on Stratumseind Visitors who mostly go out on Thursday and Friday claim that most aggression happens on Saturday, however people interviewed on Saturday almost unanimously claim there is not much aggression on Stratumseind

visitors find it so attractive: “Well, first of all, there are like 45 bars, so there’s a bar for everybody. And also, everybody goes there so besides that you can have whatever you want, you meet other people” (PS7, Male, 24).

For decades now, Stratumseind is the place where local youth go for a night out. As many have their first glass of alcohol there and get introduced to the unwritten rules of nightlife, some characterize Stratumseind as an educational area, where local youth learns to go out: “This street is like a pedagogical center, where our youth learns the rules of going out” (Bar Owner 1). Because of what Stratumseind has to offer, many different people use the same space for their night out: “There are many different people on Stratumseind, yes” (Bar Owner 3). We noted differences in crowd demographics between the three weekend nights. The Thursday crowd is young, with little diversity in cultural background and social class. Experts, police and bar staff, characterize it as the students’ night: many students from the university and other educational institutions in the area traditionally go out for Thursday evening drinks. On Fridays the crowd is slightly older “On Fridays the crowd is somewhat older. Somewhere around 19–20s, just a bit older” (Bar Owner 5) and one sees more different nationalities and racial diversity on the street. Also, sub-populations stand out more (e.g., alternative, rockers, mainstream, etc.). The Saturday crowd appears even more diverse in terms of age, cultural background and race. More often than on the other days people exhibit unfriendly behaviors (e.g., observation note: “no attention paid to others when walking through the street – bumping into each other”). In addition, visitors themselves mention experiencing more negative interactions on Saturdays: “the atmosphere is more aggressive, you see that at the moment when you bump into someone most of the time they act aggressive. <..> I have more aggressive experiences on Saturdays” (PS3, Male, 26). In addition, the Saturday crowd seems less familiar with Stratumseind – a lot of people are walking around, raising their heads to read the names of the bars and exploring what Stratumseind has to offer.

The crowd also varies across parts of the street. The demographics and attitudes of the people we observed in the “long end” were slightly different from the ones observed in the “short end”. Unfriendly, intimidating, “macho” attitudes were more frequent in the second part of the street. That side is also less busy, less noisy, darker and less alive throughout the night,

because not every bar is open. Visitors also hinted to this difference between first and the second part of the street: “I think the first part is more inviting for people to go . . . and also, I think the last part is a bit more, when you pass the square, a bit darker. In the first part, you hear a lot of music and people talking but the last part not really” (PS9, Male, 37); “[talking about the second part of Stratumseind] Ehh. The bars are weird, I haven’t gone inside . . . one of them is quite OK, how is it called? XYX, yeah, this one is quite OK, but the other bars are weird and the people are kind of weird, I don’t know” (PS1, Female, 28).

In summary, Stratumseind hosts many different people who come to enjoy the night out. Each night, the crowd seems to have slightly different profiles. Moreover, the crowd profiles differ between the first and in the second part of the street. This was generally reflected in the reports of all stakeholders and in line with our observations. Different people interact with their environment differently and thus, through this interaction, different socio physical contexts may emerge in the same location

*Atmosphere is a snapshot of the current socio-physical context and it can be sensed by individuals present in a place, regardless of their role*

While watching people on the street, one can observe and feel the atmosphere. Although atmosphere itself might be a slightly abstract term, it can be recognized through people’s attitudes, mood, behaviors and interactions with one another as well as with their immediate environment. For example, if people are friendly to each other [observation note: “people high-five each other, hug, etc.”; “many couples are making out at the sides of the buildings”] the atmosphere is usually perceived and evaluated as positive [observation note: the overall atmosphere is less happy than at the beginning of the evening, but still very positive”]; whereas, when more harsh, unfriendly interactions are observed, such as people pushing or hitting street furniture, walking fast through the street and not minding others [observation note: “people interact harshly with each other”; “many frowned faces”; “kicking stuff on their way – ‘playing football’”], the atmosphere is perceived as worse, less positive, sometimes as bad and tense [observation note: “no aggressive behavior, but it doesn’t feel like a great night”; “atmosphere is really not good – something is in the air”]. In other words,

atmosphere is a tangible characteristic of social context, colored through interactions with other visitors.

Not only observers, but participants too, sense the atmosphere. We learned that visitors perceive the atmosphere through a combination of their expectations of the night, their internal states (e.g., relaxed, beginning of vacations), and how they see other people: “We just arrived, but I think that the atmosphere is good. At least amongst ourselves it feels good” (P56, male, 22); “[about the atmosphere] Good, friendly. I have not yet seen any weird things” (P59, male, 22); “[about the mood] Uh, yes, good. It’s almost holiday, so that’s good hey. We’re here today with some of us that are done with school, so we’re going to have few beers” (P56, male, 22).

Police also regularly refer to atmosphere. One of the techniques the police use to evaluate the general situation on the street and anticipate people’s behavior is evaluating the atmosphere. Although predicting people’s behavior is barely possible, estimating it through atmosphere helps a lot in their work – “<.> we sense from the crowd whether a certain atmosphere may be developing” (Police Representative), because as the atmosphere gets worse there is a higher likelihood that more incidents, unwanted behaviors will occur: “So on some evenings minor annoyances can lead to big incidents. At a given moment, you start to feel that this is happening” (Police Representative). These reflections of police and security staff imply that atmosphere is not only relevant in and of itself, but it also serves as an important indicator for the risk of incidents and escalations.

By observing the social context – people’s facial expressions, interactions with each other and their immediate environment, and the general mood of the crowd – one can sense the atmosphere. Importantly, this general and shared sense of atmosphere appears to be recognized similarly among all users: visitors, bar personnel, police, and relative outsiders such as us.

*External factors, such as crowdedness of the environment, social happenings or important sports games, can significantly affect the atmosphere*

We noticed that external happenings (e.g., a World Cup game or Roze Zaterdag – a gay pride event) had a strong influence on the atmosphere [observation note: “the mood and atmosphere is not really good – a bit tense (at the time the soccer game was not going well for the Dutch team)”. Our observations were supported by visitors’ remarks collected on the night of the game between the Netherlands and Costa Rica in the Football World Cup (which many visitors watched on Stratumseind, and that the Dutch eventually won). The majority of interviewees referred to it, when probed for their mood “How do you feel his evening?”: “Super! Enthusiastic!” (P82, male, 23); “What do you think about the atmosphere here on the street?”: “Nice, busy. Enthusiastic” (P82, male, 2); “What is your mood at the moment?”: “Nice, we have won you know!” (P86, female, 33).

Crowdedness was another factor that appeared to play a role in shaping how the atmosphere was perceived by visitors. If is not busy ‘enough’, people may perceive the atmosphere as boring, whereas a too busy street can also become stressful: “How would you describe the atmosphere here?: “Boring” (P75, male, 33); “Boring, <.> because it is not busy” (P81, male, XX); “And so

far as you’ve experienced the street, how do you like it?”: “It is interesting. So far not a lot of people [slight disappointment], maybe it’s more crowded later on. But it’s good” (P72, male, 35); “Sometimes when it’s crowded because the streets are really narrow, it’s like . . . How do you call it . . . oppressive?” (Female, 23). Our observations also reflected this relationship between the number of people on the street and the atmosphere; less busy parts of the street were evaluated as (too) calm: [observation note: “very calm evening; boring; not crowded”]; whereas a comfortable number of people made the environment more lively: [observation note: “second part of the street is much busier than usual; second part of the street looks better when filled with people”].

*Atmosphere is a dynamic phenomenon, which subtly fluctuates throughout the course of the night*

An important aspect of atmosphere is that it is dynamic, continuously changing. The changes, though, were rarely radical, but rather gradual. For example, the World Cup game between Holland and Costa Rica was tough and intense and we observed a similarly tense, rough atmosphere on Stratumseind [observation note: “the mood and atmosphere are not really good – a bit tense”]. Within an hour, the game was won by the Dutch team and we observed a positive change in the atmosphere [observation note: “at the moment of victory people finally look very happy”; “people are happy, but still some frustration in the air”]. Yet, as the latter quotation from observations illustrates, the shift in atmosphere was only modest and for the remainder of the night it felt as if the tension from the beginning of the night lingered: [observation note: “the atmosphere isn’t really good”; “no aggressive behavior, but it doesn’t feel like a great night”]. Visitors did not explicitly reflect on this phenomenon in the interviews, but an interview with the police confirmed our observations that atmosphere can fluctuate throughout the course of the night: “Yes, indeed. It can also be that an evening starts very jovially and that there are few problems, and then there’s a turning point, and colleagues say we don’t know what has happened, but the atmosphere has changed, and then you are going to see the number of small incidents increase” (Police Representative). In sum, atmosphere may improve or decline throughout the course of the night, although changes will be rather gradual.

*Atmosphere foreshadows the likelihood of aggressive behavior*

To understand how, and if at all, escalations, aggression or other types of unwanted incidents could be predicted, we asked the experts – the police – to share their experiences. As mentioned above, tense atmosphere was reported to be a sign of possible increase in aggressive or otherwise unwanted behaviors – if the atmosphere is tense, the police are more vigilant, whereas if people are happy and the street looks calm, escalations or irritations are less likely. Besides atmosphere, police also pay attention to other social and physical cues. The amount of garbage on the street for instance, according to them, communicates a negative descriptive behavioral norm. People are sensitive and responsive to the environment. When the environment is dirty that sends an implicit message to visitors that

littering is an acceptable behavior: “It raises a certain image which causes certain, I don’t want to say, deterioration, which, once it has begun, will only continue to grow. People become increasingly careless, because people think, oh well, there is already glass lying there, I will just throw mine on the ground as well” (Police Representative). The same holds for the interactions between people: as people get less feedback from their peers on their behavior, or the opposite – receive group pressure to behave badly, positive behavior gradually diminishes: “Group influence plays a role. And particularly, when they’ve consumed a lot of alcohol, irritation level is reached fast. And those groups, if they start to target a certain person, then all of them will join in” (Police Representative). So the police are also very much aware of the role of peer pressure and the norms laid down by peer behavior.

In conclusion, behavior can be anticipated through evaluations of the physical environment, people’s interactions and the atmosphere on the street. This conclusion was corroborated by interviews with the police and bar personnel, and our observations. It was not explicitly mentioned by visitors themselves. In police work, this is mostly done by observing the crowd from strategic spots with a good overview.

*Alcohol intake deteriorates the quality and increases the quantity of social interactions and thus increases the likelihood of intentional and unintentional asocial behavior*

With the evenings progressing, alcohol and drugs consumption increased and the level of intoxication rose [observation note: “people look drunk, but not too drunk”; a few hours later that night “people look drunk now”; “drunkenness is increasing fast”]. With increasing levels of alcohol in their blood, people started behaving differently – one notices a clear decrease in coordination of walking [observation note: “bumping into each other”], a narrowed field of view [observation note: “some are standing outside in the middle of the street, talking to each other, blocking the street and not paying attention to it; bumping into each other”], a shorter attention span during the street interviews [observation note: “as we try to interview her, a very drunk girl cannot answer our questions”], increased self-confidence [observation note: “a girl dressed in a revealing outfit is dancing on the terrace table”], increased approaching behavior [observation note: “we are approached more often by drunk guys; another drunk guy came up to us, tried to speak to us, but we couldn’t understand a word he said, then he invited other friends, we moved away, they left” – both observers were females] and smaller interpersonal distances. Men started to exhibit macho behavior, compete with each other for women’s attention and provoked each other more often. Generally, more personal boundaries were crossed towards the end of the night – flirting, touching, and coming (too) close [observation note: “Two young drunk guys try to take off ‘cat ears’ from girl’s head; the interaction is flirty, rather than pestering”]. Some of these interactions were negative, due to people’s inability to read others’ signals and reflect on their own behavior [observation note: “A girl throws a bottle cap to Rob. She has an angry drunk look in her face; before she throws it she looks at me with hesitation – the reason for this could have been the camera that Observer 2 had in his hands”] or due to lack of coordination –

some people were too drunk to behave gracefully [observation note: “A group of young drunk guys try to kick into the air, sort of playing a ball; very uncoordinated movements”]. Alcohol thus seems to strongly influence the quality of interpersonal interactions.

As more alcohol is consumed, people get less sensitive and notice less what happens around them and how their presence and actions affect others’ wellbeing [observation note: “people are focusing less on others than on themselves – they seem to have become ruder and occasionally bump into each other”; “narrowed attention – e.g., one guy almost crashes into me, looks only straight ahead and doesn’t even notice me (neither turns his head, nor says sorry)”]. Their behavior at times can become asocial and even illegal – walking wide and broad, not noticing other people, bumping into others, throwing and kicking glass and garbage on the street – and they appear unable to evaluate the consequences of that behavior. Besides potentially harming others or themselves, some of these asocial and uncontrolled behaviors dictate unwanted descriptive social norms, which influence subsequent behavior. Thus, mainly from our field observations we conclude that alcohol influences not only how people interact with each other, but also how they interact with their immediate environment.

*Aggression on Stratumseind is alcohol related, but often not directly caused by alcohol abuse*

Alcohol influences people’s performance, perception and behavior. Most of the aggression on Stratumseind appears alcohol related: “Had too much to drink” (P15, male, 20); “Alcohol. And the other reason would be girls. Or like when Holland wasn’t playing that good against Costa Rica, people get tense and annoyed” (P7, male, 20). Reflecting specifically on aggression, alcohol influences how people process the outcome of these interactions and how they cope with their inner psychological states, such as frustration. On Stratumseind this appears to facilitate aggressive behavior: “No reasons. Mostly, with drinking one gets frustrated and then it all comes out” (P13, female, 17); “Yes, yes, yes, and alcohol can escalate everything” (P45, male, 23); “Aggression that they want to unleash from work. Or that they are not happy with their home life. Just aggression that they want to direct to someone to get it out” (P8, male, 19); “Someone was messing and you’re drinking and then he hits you, and then you hit him as well, and then you look at each other and then you start hitting each other and then . . .” (P27, male, 26).

Yet whereas alcohol clearly facilitates aggression, the causes for underlying frustrations may be diverse – they may have emerged on the spot or have their roots earlier in time as one of our experts said: “Yes, everyone has a bad day now and then. Relationships, exams, problems in the family. Everyone has something at some point . . .” (Bar Owner 5). “< . . > this is at the end the cauldron of it all” (P44, male, 22).

*Unfamiliarity with a place and behavioral norms and high densities of people belonging to different social groups increase the likelihood of asocial, or even aggressive behaviors*

Our results revealed several social circumstances in which aggressive behavior could be triggered. This was supported by all

three different sources of data. People often suggested perceived differences between subcultural groups as a possible instigator of aggressive behavior. For example, the difference between mainstream and alternative groups: “That is Club XX in front of Café YY. Those are two extreme opposites in front of each other, which is iconic for Stratumseind; that two completely different target groups can search for their way” (P41, male, 19). As we already know, Stratumseind has such a diverse selection of different bars that the chance that groups collide is indeed high: “Yes, I can imagine that there are many different bars, also different types of bars are close together. Therefore you have a lot of different cultures, which easily get in each other’s face. Especially after closing time and then it clashes” (P39, male, 24); “Yes, many bars have their own identity and then, when everyone goes outside” (P38, male, 24). Police also mentioned the possible influence of cultural differences: “Because a lot of people go there, also a lot of different people, so you have a lot of people together with different origins. [for example] Club XX, Bars YY and ZZ, because they attract a lot of minorities <...> So that’s where too many different cultures meet” (Police Representative).

Furthermore, experts indicated that aggression may be enhanced by people’s unfamiliarity with Stratumseind which differs per weekend day: “<...> and on Saturday they come from outside the city. The Friday is a real Eindhoven party and you can meet everyone you know and on Saturday you see more unfamiliar people” (Bar Owner 4). If the crowd is diverse and less familiar with the environment chances are that they will not be aware of the behavioral norms in this environment and have a different idea of a typical night out.

#### *Crowding increases the likelihood of aggressive behavior*

Our observations took place in the summer. During most of the nights the weather was good and a lot of people lingered outside. Stratumseind is a narrow street with a high density of bars, so at times it can get very crowded. People gather, meet, socialize, dance, and drink outside: “I like that there’s music coming outside so you can stay on the street and dance a little <...>” (PS10, Female, 28); “<...> in the places I like to hang more you can choose between a little bit of music outside and just sit and hang there, or inside <...>” (PS7, Male, 24); “Alright, at the beginning, near the church at YZ and ZZ there are always a lot of people outside, the first few bars. <...> When you walk further down, the street gets smaller so it is more crowded. Especially when it is later, later in the evening, like 1 or 2 in the evening” (PS5, Female, 23). Stratumseind usually reaches its peak density around midnight around closing time (at 2:00AM on Thursdays or 4:00AM on Fridays and Saturdays). People go out on the street for various reasons – some to leave the street, others to get their jackets from the wardrobes, which are outside the bars, some to go to another pub. At times, moving through is almost impossible and people have to wait, standing very close to each other. In these situations, frustrations and annoyances emerge, mostly because some individuals start to exhibit asocial behaviors (e.g., push through the crowd): “A lot of people are grabbing you and talking to you and being obnoxious because they’re drunk. And often they’re blocking your way when you are trying to walk through. Yeah so ...” (PS10, Female, 28); “Well one of the

things I don’t like is when it’s crowded, <...> it is very crowded to walk through, so then the walkway is too narrow, the walking area is too small. That’s a problem, because then you can get some people to get aggressive, because you come too close for their feeling, so that’s one thing I don’t like” (PS3, Male, 26); “But when you’re outside and it’s crowded and people bump into each other, it sometimes is not so fun because you get into conflicts” (PS8, Female, 26). So negative affect caused by crowding in combination with alcohol sometimes can lead to aggression. Moreover, if incidents occur during these crowded situations, police work becomes more difficult as it gets harder to reach the location of the incident. “The only thing that matters is the incident, but because there are so many people, it becomes difficult for us to do our job” (Police Representative).

In conclusion, Stratumseind at times can get crowded. Across different sources, our data shows that besides the fact that crowding disturbs the work of police and other services, such as ambulances, crowding can cause frustration and induce negative affect, as well as negatively influence visitors’ experience. More importantly, crowding, as an aspect of the socio-physical context, increases the risk of escalations and aggressive behavior.

#### *Small groups of young males with ‘macho’ attitudes are more likely to be aggressive*

During the six observation nights we did not observe any acts of severe aggression or violence that would call for an intervention or arrest by the police; few were also reported in the police records. We did ask our experts and visitors to describe the typical aggressors on Stratumseind. The police officer mentioned that heightened arousal, testosterone levels and cultural background are important factors to take into account, when describing potential aggressors: “Those who exhibit macho behavior. They have little tolerance for each other and want to settle arguments through fighting. What we notice is that certain type of music at the closing hour can create a certain atmosphere and then people come outside with certain levels of adrenaline.” (Police Representative). Other experts shared that (young) males are more likely to engage in violence than females: “Rarely women. 1 out of 20, I guess” (Bar Owner 2) and “Usually they are somewhat younger guys. They come in groups and feel as if they need to prove themselves” (Bar Owner 5). Even if the fight is sometimes started between girls, usually men take over: “Yes, girls are not so bad. But that’s maybe because the majority of the crowd are men. And even if there’s something that was started by girls, men take over and it escalates among them” (Security 3).

More severe cases of aggression usually involve small groups (e.g., football fans), often consisting of male adolescents, exhibiting specific “showing off” behaviors: “Yes, and sometimes gangs with specific behavior. <...> young males, street guys, who most likely have no money. And therefore they come to consciously play predators in small groups of four or five” (Security 1). Similar attitudes, “wanting to impress” and “macho” personalities were also mentioned by the visitors as traits of aggressors: “Yes, macho behavior and checking who’s better. And, yes, then some guys find it cool to be like this in front of the women. Well, I don’t find it nice, but everyone is different and maybe it is acceptable for other people” (P16, female, 19);

“Yeah, it’s always the macho guys. It’s not the students; it also doesn’t happen on Thursdays. That’s really nice but sometimes there are these guys who want to impress girls and yeah, some, some just look like they want to do it for fun” (PS8, Female, 26).

In sum, based on interviews with visitors and experts, it seems that a profile of the typical Stratumseind’s aggressor exists, however this profile seems to be more likely to be seen involved in severe and registered cases of aggression, than represent the more general experience of aggression of the whole crowd.

*Incidents of aggression, as reported in the police reports, do not reflect what aggression is or how it is experienced by visitors*

Interviews with visitors revealed an interesting finding: people expect to witness aggression on Stratumseind. Even if visitors at the time of the interview had not seen aggression, most of them indicated that they expected to see asocial or aggressive behavior somewhere throughout the course of the night: “And aggressive behavior?”: “Not yet. I say not yet, because generally, speaking from experience, now and then you see some aggression here” (P62, female, 19); “Okay and have you seen anything annoying this evening?”: “No, not yet” (P55, male, 27). Perhaps people indeed expect to see aggression because they experienced it there in the past, or because in the media Stratumseind is often associated with aggression, however, visitors’ expectations did not appear to reflect the actual occurrence or frequency of incidents at the times of observations.

As mentioned above, we did not observe severe acts of aggression or violence. Moreover, police reports from the days of our studies also showed low numbers of incidents reported to the central system. This, however, does not mean that we did not observe aggression, as we did record harsh and aggressive interactions among Stratumseind visitors, for example, yelling or swearing at each other, pushing and pulling, purposely blocking the road for the others or making threats. To illustrate this, we compared the police reports on the atmosphere and number of arrests on two Saturdays of our observations. During the first Saturday, which was described as calm, six arrests were made in total, whereas the second observation Saturday, which was described as tense and full of negative emotions, resulted in (only) eight arrests. It seems that the number of arrests or aggressive incidents reported in official statistics does not necessarily represent the experience of aggression or the overall experience of Stratumseind.

## DISCUSSION

With this qualitative case study, we aimed to investigate the role of the socio-physical context on the development of aggression in urban nightlife settings, and to explicate how aggression may emerge from the reciprocal interactions between person and environment. Using a multi-method approach, followed by thematic analysis, we, in particular, investigated how aggression in larger groups emerges and unfolds over time, and how changes in the socio-physical environment co-occur with changing patterns of aggressive behavior. In addition, we aimed to identify relevant behavioral and/or situational markers for predicting aggression.

Stratumseind is a relatively enclosed urban area devoted to nightlife entertainment. However, our research shows that we cannot speak of Stratumseind as a single and static entity. The two physical parts of the street accommodate crowds that differ in size and demographics in accordance with the different density and types of bars in each of these parts. Furthermore, crowd characteristics differ depending on the going-out night. Even during one night, the appearance of Stratumseind is in constant flux, changing as the night evolves. Different people come and go, leaving their footprints on Stratumseind. We found that, in particular, the ratio of visitors who are unfamiliar with Stratumseind, and groups of visitors showing “macho” attitudes make up an important part of the socio-physical context. Moreover, and in line with the literature, we observed that as the crowd gets gradually intoxicated, alcohol seems to influence the quality of social interactions (Graham, West & Wells, 2000; Graham *et al.*, 1998; Keane & Lisman, 1980). Our results call attention to the complexity of the “real world” when studying the development of aggression, and underscore the importance of a research approach that is sensitive to these dynamic changes in the socio-physical environment over the course of a night. This is in line with the ecological approach proposed by Goldstein (1994).

Aggression on Stratumseind to date is often inferred from incident rates in police reports. These reports, however, only include registered disturbances and acts of violence, which neither fully reflect what aggression on Stratumseind is, nor how visitors experience it. Through our observations, we discovered that other types of aggression exist and they are not registered alongside violent incidents in police reports. These are typically milder in form and extent, yet more frequent, more shared and more directed at everyone or anyone in the street. Moreover, throughout all sources of our data we found that the *experience of tension* and the subsequent *anticipation of aggression*, as a result of these observed or experienced *deteriorating interactions* within the crowd, better reflect the experience of aggression on the street. Even when visitors had not witnessed severe or mild forms of aggression, many expect aggression over the course of the night, particularly when the atmosphere is tense. Indeed, consistently through observations and interviews with visitors, bar personnel, and police, we learned that one of the most distinctive and relevant characteristic of the socio-physical environment at any given time was the atmosphere. Sensed by all groups of Stratumseind users – visitors, police, and third parties, such as researchers alike – atmosphere by and large is the result of people’s interactions with each other and with their immediate physical environment. Atmosphere was observed to be dynamic, influenced by external happenings, and thus subject to change over the course of the night. Our results suggest that atmosphere may affect the likelihood that an individual will aggress, and thus that changes in atmosphere are a potentially interesting indicator of the development of aggression in urban nightlife areas. Although such a causal link between changes in atmosphere and aggression cannot be established on the basis of the current analysis, our data do demonstrate that negative atmosphere and the resulting anticipation of aggression are in themselves unwanted and relevant to address if one wants to improve the quality and experience of urban areas.

At the level of a single social interaction, or episode in the GAM (Anderson, Deuser & DeNeve, 1995), the changing atmosphere on Stratumseind can be considered as a part of the immediate situation in which that episode takes place. On Stratumseind we recognize distal (expectations, earlier experiences) as well as the proximate (individual, situation, psychological state, intoxication levels, appraisals of the context) influences on aggressive behavior. However, this individual-centered and episode-based GAM perspective somehow does not sufficiently emphasize the essence of what happens in the street.

While each individual visitor processes the atmosphere in the street as context, their subsequent behavior on Stratumseind biases the context for others. This co-shaping of each other's experiences clearly reflects the interactionist perspective forwarded by Goldstein (1994), in which neither the individual, nor the social and physical environment are independently accountable for aggression, but in which members of the crowd reciprocally influence each other, at the same time a victim to and propagator of the building tension in the street. Thus, our study suggests that although certain personalities and visitor profiles may be more likely to exhibit aggressive or even violent behavior, everyone on Stratumseind can become susceptible to aggression – at least up to the level of the milder bouts of negative interactions we encountered frequently, due to strong influences of ever changing situational factors, such as tense atmospheres, intoxication, crowding.

Atmosphere has been studied in the context of retail environments affecting buying behavior (e.g., Donovan & Rossiter, 1982; Donovan, Rossiter, Marcolyn & Nesdale, 1994; Kotler, 1973; Turley & Milliman, 2000), as a determinant of the overall experience of places and events, including sports games in the large stadiums (e.g., Uhrich & Benkenstein, 2010), and for the home environment (e.g., Pennartz, 1986). In this line of research, scholars agree that atmosphere can be sensed (Kotler, 1973) and that it emerges through reciprocal relationship between people and the physical environment (Pennartz, 1986; Turley & Milliman, 2000). Some researchers have suggested that environmental and/or social components of atmosphere, including ambient factors, such as colors and sounds, have the potential to bias psychological states (e.g., high arousal, positive affect), which in turn may influence people's behavior (Donovan & Rossiter, 1982; Turley & Milliman, 2000). Our work suggests that atmosphere emerges through people and environment interactions. We discovered that it was a real and tangible characteristic of our socio-physical setting. We use the terms "real" and "tangible" to illustrate that this phenomenon – which in other literature is often implicitly referred to as volatile or abstract – was actually very present in the accounts of all the different stakeholders and that, regardless of their role or perspective, they sensed and described it in very similar ways. Atmosphere, we learned, pertains to a mood-like, but extra-individual state of the given socio-physical setting, it is a property of both the crowd and the environment that can be sensed and observed by all those present through extra-individual patterns of behavior, that is, in commonalities in expressions, interactions, and communications.

#### *Limitations and future studies*

First, due to its qualitative and explorative nature, no causal inferences can or should be drawn from our observations. We noted that changes in the socio-physical environment co-occur with changing patterns of aggressive behavior. Based on our findings we suggest that atmosphere may affect the likelihood that an individual will aggress, and thus that changes in atmosphere are potentially interesting indicators of the development of aggression in urban nightlife areas. It should be made explicit, however, that the current status of this suggestion is that of a hypothesis, one that we propose would be relevant to test in future studies.

Second, although our data collection extended over multiple days and numerous hours, each acting as a benchmark for the others, our research had Stratumseind as the single case. A relevant question, thus, is to what extent our findings are relevant and applicable to other urban (nightlife or entertainment) contexts. Because of each setting's uniqueness, atmosphere and the role it plays may vary across contexts. In our case, atmosphere appeared to be strongly determined by the continuous interactions between Stratumseind visitors and their social and physical environment, by their mood and intoxication levels, and by crowding. In a different context the role of other situational variables may well become more prominent. It would thus be very valuable to investigate the dynamic changes in and effects of atmosphere in other places susceptible to aggression. Also, although we excluded days with events that would be considered atypical for the Stratumseind nightlife, inclusion of days was a least partly pragmatic, that is, we did not draw a representative sample of days across the year or seasons. We hence cannot generalize our findings to for instance extreme weather conditions.

In terms of capturing the essence of Stratumseind nightlife, we need to acknowledge that forty hours of observation still make up only a small fraction of the entire year. They cover only one season, for instance, but they did include a few days with special events (a street party, football matches), as well as days without them. Moreover, the interviews with stakeholders – police, bar personnel, visitors – covered their experiences over a more extended time frame and hence complemented the observations and police reports also in a temporal perspective. We also acknowledge that the sample size of the interviews with security staff and police was rather small – three and one. Although we were still able to draw conclusions from this data, perhaps in the future it would be interesting and valuable to inquire these specific groups of stakeholders once more to see how their respective roles might influence their general view on atmosphere and its relation with aggression, their beliefs with regard to the environmental influences on people's behavior, and how they try to prevent or deal with aggressive situations and atmospheres.

#### CONCLUSION

In the context of research in naturalistic settings, our study suggests that atmosphere, as an attribute of the socio-physical context, is strongly related to the emergence of aggression and tension in public spaces such as Stratumseind. At the individual level, it appears to play its part as proximate determinant of behavior; at the crowd level it reflects the

synergetic product of all those persons' states, behaviors and interactions.

Our work also showed that to isolate and capture all the aggressive behaviors that are happening in a naturalistic setting would be extremely difficult, if not impossible, and that an alternative measure is necessary. Thus, we strongly believe that to increase our understanding of and potential grip on aggression in urban spaces such as Stratumseind, atmosphere at the crowd level becomes an extremely important construct. In the future, manipulating or nudging the atmosphere, possibly through environmental interventions, may offer an interesting intervention to prevent or reduce unwanted, asocial and aggressive behaviors in an urban nightlife setting. Yet before we can contemplate how to potentially "nudge" it, defining, capturing, and perhaps even quantifying it presents a major challenge for future research.

The current work was made possible by financial support received from the Netherlands Organization for Scientific Research, under project number 314-99-112.

## REFERENCES

- Altman, I. (1975). *The environment and social behavior: Privacy, personal space, territory, and crowding*. Monterey, CA: Brooks/Cole Pub. Co.
- Anderson, C. A. (2001). Heat and violence. *Current Directions in Psychological Science*, 10, 33–38.
- Anderson, C. A. & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology*, 53, 27–51.
- Anderson, C. A. & Carnagey, N. L. (2004). Violent evil and the general aggression model. In A. Miller (Ed.), *The social psychology of good and evil* (pp. 168–192). New York: Guilford Press.
- Anderson, C. A., Deuser, W. E. & DeNeve, K. M. (1995). Hot temperatures, hostile affect, hostile cognition, and arousal: Tests of a general model of affective aggression. *Personality and Social Psychology Bulletin*, 21, 434–448.
- Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative research*, 1, 385–405.
- Bandura, A. (1978). The self-system in reciprocal determinism. *American Psychologist*, 33, 344–358.
- Baron, R. A. & Bell, P. A. (1976). Aggression and heat: The influence of ambient temperature, negative affect, and a cooling drink on physical aggression. *Journal of Personality and Social Psychology*, 33, 245–255.
- Barker, R. G. (1968). *Ecological psychology*. Stanford CA: Stanford University Press.
- Bartholow, B. D., Anderson, C. A., Carnagey, N. L. & Benjamin, A. J. (2005). Interactive effects of life experience and situational cues on aggression: The weapons priming effect in hunters and nonhunters. *Journal of Experimental Social Psychology*, 41, 48–60.
- Baum, A. & Greenberg, C. I. (1975). Waiting for a crowd: The behavioral and perceptual effects of anticipated crowding. *Journal of Personality and Social Psychology*, 32, 671–679.
- Baum, A. & Koman, S. (1976). Differential response to anticipated crowding: Psychological effects of social and spatial density. *Journal of Personality and Social Psychology*, 34, 526–536.
- Berkowitz, L. (1964). Aggressive cues in aggressive behavior and hostility catharsis. *Psychological Review*, 71, 104–122.
- Berkowitz, L. & LePage, A. (1967). Weapons as aggression-eliciting stimuli. *Journal of Personality and Social Psychology*, 7, 202–207.
- Carlson, M., Marcus-Newhall, A. & Miller, N. (1990). Effects of situational aggression cues: a quantitative review. *Journal of Personality and Social Psychology*, 58, 622–633.
- DeWall, C. N., Baumeister, R. F., Stillman, T. F. & Gailliot, M. T. (2007). Violence restrained: Effects of self-regulation and its depletion on aggression. *Journal of Experimental Social Psychology*, 43, 62–76.
- Donnerstein, E. & Wilson, D. W. (1976). Effects of noise and perceived control on ongoing and subsequent aggressive behavior. *Journal of Personality and Social Psychology*, 34, 774–781.
- Donovan, R. J. & Rossiter, J. R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing*, 58, 34–57.
- Donovan, R. J., Rossiter, J. R., Marcoolyn, G. & Nesdale, A. (1994). Store atmosphere and purchasing behavior. *Journal of retailing*, 70, 283–294.
- Farrell, A. D., Mays, S., Bettencourt, A., Erwin, E. H., Vulin-Reynolds, M. & Allison, K. W. (2010). Environmental influences on fighting versus nonviolent behavior in peer situations: A qualitative study with urban African American adolescents. *American Journal of Community Psychology*, 46, 19–35.
- Geen, R. G. (1978). Effects of attack and uncontrollable noise on aggression. *Journal of Research in Personality*, 12, 15–29.
- Geen, R. G. & O'Neal, E. C. (1969). Activation of cue-elicited aggression by general arousal. *Journal of Personality and Social Psychology*, 11, 289–295.
- Goldstein, A. P. (1994). *The ecology of aggression*. New York: Plenum.
- Goldstein, A. P. (1997) Controlling vandalism: The person-environment duet. In A. P. Goldstein & J. Close Conoly (Eds.), *School violence intervention: A practical handbook* (pp. 290–321). New York: Guilford Press.
- Graham, K., Bernards, S., Osgood, D. W. & Wells, S. (2006). Bad nights or bad bars? Multi-level analysis of environmental predictors of aggression in late-night large-capacity bars and clubs. *Addiction*, 101, 1569–1580.
- Graham, K., Leonard, K. E., Room, R., Wild, T. C., Pihl, R. O., Bois, C. & Single, E. (1998). Current directions in research on understanding and preventing intoxicated aggression. *Addiction*, 93, 659–676.
- Graham, K., Osgood, D. W., Zibrowski, E., Purcell, J., Gliksmann, L., Leonard, K. et al. (2004). The effect of the Safer Bars programme on physical aggression in bars: Results of a randomized controlled trial. *Drug and Alcohol Review*, 23, 31–41.
- Graham, K. & Wells, S. (2003). 'Somebody's gonna get their head kicked in tonight!' Aggression among young males in bars – a question of values? *British Journal of Criminology*, 43, 546–566.
- Graham, K., West, P. & Wells, S. (2000). Evaluating theories of alcohol-related aggression using observations of young adults in bars. *Addiction*, 95, 847–863.
- Homel, R., Tomsen, S. & Thommeny, J. (1992). Public drinking and violence: Not just an alcohol problem. *Journal of Drug Issues*, 22, 679–697.
- Keane, T. M. & Lisman, S. A. (1980). Alcohol and social anxiety in males: Behavioral, cognitive, and physiological effects. *Journal of Abnormal Psychology*, 89, 213–223.
- Kimpton, A., Corcoran, J. & Wickes, R. (2016). Greenspace and crime: An analysis of greenspace types, neighboring composition, and the temporal dimensions of crime. *Journal of Research in Crime and Delinquency*, 54, 303–337.
- Kotler, P. (1973). Atmospherics as a marketing tool. *Journal of Retailing*, 49, 48–64.
- Kuo, F. E. & Sullivan, W. C. (2001). Environment and crime in the inner city: Does vegetation reduce crime? *Environment and Behavior*, 33, 343–367.
- Locke, B. D. & Mahalik, J. R. (2005). Examining masculinity norms, problem drinking, and athletic involvement as predictors of sexual aggression in college men. *Journal of Counseling Psychology*, 52, 279–283.
- Macintyre, S. & Homel, R. (1997). Danger on the dance floor: A study of interior design, crowding and aggression in nightclubs. In R. Homel (Ed.), *Policing for prevention: Reducing crime, public intoxication and injury* (pp. 91–113). New York: Criminal Justice Press.
- McMahon, S. D., Todd, N. R., Martinez, A., Coker, C., Sheu, C. F., Washburn, J. & Shah, S. (2013). Aggressive and prosocial behavior: Community violence, cognitive, and behavioral predictors among urban African American youth. *American Journal of Community Psychology*, 51, 407–421.

- Pennartz, P. J. (1986). Atmosphere at home: A qualitative approach. *Journal of Environmental Psychology, 6*, 135–153.
- Prentice-Dunn, S. & Rogers, R. W. (1980). Effects of deindividuating situational cues and aggressive models on subjective deindividuation and aggression. *Journal of Personality and Social Psychology, 39*, 104–113.
- Reimann, M. & Zimbardo, P. G. (2011). The dark side of social encounters: Prospects for a neuroscience of human evil. *Journal of Neuroscience, Psychology, and Economics, 4*, 174–180.
- Romero, E., Richards, M. H., Harrison, P. R., Garbarino, J. & Mozley, M. (2015). The role of neighborhood in the development of aggression in urban African American youth: A multilevel analysis. *American Journal of Community Psychology, 56*, 156–169.
- Russell, G. W. (1983). Crowd size and density in relation to athletic aggression and performance. *Social Behavior and Personality: An International Journal, 11*, 9–15.
- Turley, L. W. & Milliman, R. E. (2000). Atmospheric effects on shopping behavior: A review of the experimental evidence. *Journal of Business Research, 49*, 193–211.
- Uhrich, S. & Benkenstein, M. (2010). Sport stadium atmosphere: formative and reflective indicators for operationalizing the construct. *Journal of Sport Management, 24*, 211–237.
- van der Leun, J. & Koemans, M. (2013). Down these mean streets: An analysis of the local public discourse on antisocial behaviour in disadvantaged urban neighbourhoods in the Netherlands. *Urban Studies, 50*, 3342–3359.
- Welsh, B. P. & Farrington, D. C. (2008). Effects of improved street lighting on crime. *Campbell Systematic Reviews, 4*(13), <https://doi.org/10.4073/csr.2008.13>.
- Wicker, A. W. (1979). Ecological psychology: Some recent and prospective developments. *American Psychologist, 34*, 755–765.

Received 28 July 2017, accepted 7 January 2018