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Photo on the front cover: Magnus Rönn.
The photo show artistic design from an introduction course for students in architecture, called A1, at Chalmers University of Technology.

ARCHITECTURE AND DEVIANCE IN SCHOOLS – IMPLICATIONS OF A META-SYNTHESIS OF HOTSPOTS IN SWEDISH SCHOOLS

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Abstract

To investigate the function of place in relation to deviance, this article looks at hotspots for three different types of deviant events in Swedish schools: assaults, bullying, and deliberate fire-setting. Drawing upon a qualitative meta-synthesis of ten Swedish reports that address such incidents, the analysis identifies three categories of hotspot that occur in school settings – restrooms, hallways, and student lounges. The study also found that deviant events tend to correlate with specific combinations of socio-spatial patterns and criminogenic elements that in turn are related to the physical design of a space. The study's findings indicate that the school's physical structure and built environment play an import role in either facilitating or hindering the likelihood of deviant events occurring. Accordingly, architecture and especially school design can promote prevention strategies by more strongly acknowledging the role of place in risky situations.

Introduction

School safety and security constitutes an important societal issue at present, in Sweden and internationally. In general, the discussions around these themes have tended to concern the occurrence of lethal violence in schools, in the form of mostly random attacks and planned mass shootings. In Sweden, key factors prompting these discussions included two lethal school attacks in Finland, in 2007 and 2008, and one, the most devastating of the three, in the city of Trollhättan in Sweden in 2015 (for an extended discussion of lethal violence in Scandinavian schools, see Thodelius & Sandén, 2017). At the same time, it is important to note that attacks of such a serious nature still remain very rare in society (Newman, Fox, Harding, Metha & Roth, 2004; Newman & Fox, 2009), even if the number of random school shootings[1] has clearly increased over time, from 1.1 cases globally per year in the 1980s to 5.7 cases globally per year in 2000–2010 (see Böckler, Seeger, Sitzer & Heitmeyer, 2013, p. 9). Geographically speaking, lethal violence is also unevenly distributed within countries, with random lethal violence occurring more often in rural schools, while targeted violence such as that resulting from gang-related conflicts is more common in urban schools (Newman et al., 2004; Bushman et al., 2016; Lindgren & Thodelius, 2017; Thodelius & Sandén, 2017). The relatively rare events, however, frequently become amplified in political debates, decision-making processes, and public discourse, leading to the neglect of more mundane and commonplace forms of deviant behaviour and violence (cf. Kasperson et al., 1988). Although lethal violence in schools remains a serious issue that all too often impacts on young people's lives and affects society in multiple ways, it is also important to recognize and find ways to prevent the more everyday dangers, threats, and risks that jeopardize young people's right to safety in school settings on an almost daily basis. This study addresses this concern by discussing deviance in schools in terms of non-lethal assaults, bullying, and deliberate fire-setting.

Objectives of the study

Schools are quite unique settings, being one of the few places where children and adolescents come together regardless of social status, while also acting as an environment where secondary socialization and the development into adulthood takes place (Hirschi, 1969; Gottfredson, 2001, p. 1; Viner et al., 2012). Schools are thus complex settings, not only because they need to be able to integrate the differing needs of students with and without pedagogical challenges: they also need to accommodate various requests from parents, politicians, and other societal actors, and provide a safe and secure place for our children to live, learn, and play with their peers.

Thus far, efforts to improve the safety of the school environment and reduce everyday deviance have mainly targeted individuals and/or the social aspects of specific incidents (e.g., the Swedish National Council for

1 For an extended discussion of the different definitions of lethal violence in schools, see, e.g., Böckler et al., 2013; Bushman et al., 2016; Thodelius & Sandén, 2017.

Crime Prevention, 2001). Yet, as has been pointed out by many scholars (e.g., Astor, Benbenishty, Marachi & Meyer, 2006), the success of social interventions aiming at deviance reduction also depends on the long-term commitment of all stakeholders, proper implementation, and the sensitivity shown to local cultures and contexts. Going against the tradition of social interventions, many studies today stress the importance of situational prevention strategies in deviance reduction. Such strategies incorporate both socioeconomic aspects and demographic profiling related to place dynamics (e.g., Cozens, Saville & Hillier, 2005; Ekblom, 2011; Cozens & Love, 2015) and give primacy to the use and function of place in deviance. Building on previous research on situational place dynamics, this article explores the possibilities of using physical design as a prevention strategy in schools. By looking in detail at hotspots in school settings where assaults, bullying, and deliberate fire-setting tend to cluster, incidents of deviance can be related not only to persons, but also to places (cf. Ratcliffe, 2004; Clarke & Eck, 2016).

The research presented in this article was guided by the following questions:

- How can hotspots of deviant behavior in school settings be interpreted in relation to the socio-spatial context?
- In which ways are the offender or opportunity structures in such possible locations related to the physical environment?
- What kind of place-based prevention strategies respond most effectively?

These are, I will argue, the kind of questions that need to be posed if architectural praxis is to be able to contribute to reducing violence in schools and creating spaces that better lend themselves to handling risky situations. Knowledge of hotspots, routine activity, and the socio-spatial context is therefore of at least the same importance for good school design as the wider question of how deviance occurs in general.

Study context
Before presenting the theoretical framework, methods, and results of this study, some remarks on the national context of the study are in order, in order to understand both the extent of deviance in Swedish schools in general and the particularities of Swedish schools and school buildings. In Sweden, the school system comprises both compulsory and non-compulsory components of school education, with the majority of the country's children and adolescents attending both. School education can take place in either public or private schools (cf. Angelov & Edmark, 2016). Students attend the compulsory comprehensive school component of the education (*grundskola*, which consists of primary and lower secondary school and includes the now mandatory pre-school class) from the age of 6 to 16, while the non-compulsory upper secondary school

education (*gymnasium*) provides an additional three-year education from the age of 16 to 19. The country's public school system constitutes Sweden's largest workplace, with more than 1.2 million persons physically present in its settings every day (the Swedish National Agency for Education, 2015). The right to safe and secure school environments is guaranteed to children and adults in the country through the Education Act as well as the Work Environment Act, which defines schools as workplaces.

Designing schools, in particular primary and lower secondary schools, is challenging in that it needs to accommodate a wide range of categories of school users, including students, teaching staff, and other school personnel, of different ages. The school environment, furthermore, is not only a learning environment that is concentrated around classrooms and pedagogical objects (for an historical overview, see Lundahl & Lawn, 2015), it also contains a great variety of different types of rooms and functions that interact in creating a place for learning, working, playing, and recreation (as stressed, among others, by de Laval, 2017, p. 5). The physical environment of the school plays, moreover, a crucial role in enabling or preventing a subjective feeling of safety and well-being in people (see, e.g., Isling Poromaa, 2016). Positive results in this regard are achieved by designing for indoor environmental quality (focusing on, e.g., light, noise, temperature), and schoolyards that stimulate play, and the physical prevention of deviance (Higgins, Hall, Wall & Woolner, 2005; Armitage, 2006; Atlas, 2013; Crowe & Fennelly, 2014).

The actual extent of deviance and other social problems in schools is in general hard to gauge, since minor incidents often go unreported and defining an incident or event as "deviant" is not always so simple. Deviance in schools tends to occur in the intersection between play and seriousness, and often with a non-harmful intention, such as when a rubbish bin is set on fire in order that students might skip class, or when teasing escalates to become true bullying or confrontations turn violent as a result of a spiralling conflict (cf. Farrington, 1993; Svensson, 2003; Persson & Uhnoo, 2015). Even if many cases of minor school violence never end up being reported, it has nonetheless been estimated that between 7 and 20 per cent of the students in Swedish schools have been directly victimized by violence, and approximately 25 per cent have witnessed violence whilst at school (Svensson, 2003, p. 229). Swedish schools, according to annual surveys, are the most probable place for Swedish youths to become victims of abuse and assault (the Swedish National Council of Crime Prevention, 2016). This is very likely due to due to the high level of risk exposure in the environment: adolescents tend to be at school seven to eight hours per day, five days a week.

Like incidents of violence, incidents involving bullying are most certainly underreported in schools, and like violence, there is no universally accepted definition of the phenomenon (see, e.g., Farrington, 1993).

Nonetheless, bullying can be seen to refer to a wide range of acts including non-verbal and verbal insult, threats, harassment, and physical violence (Munthe, 2011, p. 89 ff.). According to Friends (2017), 22 to 25 percent of all students in primary school in Sweden have been harassed in schools, with 6 to 10 percent of all primary school students reporting that they have been victims of regular bullying or harassment. In the same vein, it is also not possible to ascertain the exact extent of deliberate fire-setting in Swedish schools. As Persson and Uhnoo (2015, p. 4) have pointed out, many school fire incidents go unreported, owing to the schools' differing practices in handling fire alarms. Nevertheless, according to the Swedish Fire Protection Association, approximately 50 per cent of the total of 189 fire service calls in 2015 were due to deliberately set fires.[2]

Thus, even if the country's schools are considered generally safe and secure by Swedish school authorities (The Swedish National Agency for Education, 2017), they still can be said to suffer from social problems related to everyday deviance. While the extent of these problems is unknown, and probably varies significantly across schools, it is important, first of all, to acknowledge the existence of the problem so that it can begin to be worked with in a preventive manner. This prevention work, however, must itself recognize the limited nature of the social or pedagogical strategies employed thus far, and begin to also take into account situational factors and their influence, especially the importance of the architectural design of schools.

Theoretical framework

Schools provide one of the most important institutional settings for young citizens' socialization and development towards adulthood (Hirschi, 1969; Viner et al., 2012). Yet, they operate under rather unique preconditions, related not only to their social and pedagogical aims and challenges, but also to the physical design of the school building itself. School design is a type of architectural practice based on an aspiration to integrate complex social, pedagogical, and safety concerns in order to enable a functional work environment for students, teachers, and other school staff. It is, moreover, also important to note that today's school buildings are designed for activities and learning situations that are *expected* to occur, and therefore their design can be dysfunctional when unwanted or unexpected events occur. The theoretical framework applied in this article must, consequently, accommodate three important themes: socio-spatial interactions in deviant situations, schools as potential crime scenes, and school design based on Crime Prevention through Environmental Design (CPTED). Including a criminological dimension in the theoretical work allows the article to more clearly focus on situations and especially places through the analysis.

2   Statistics collected from The Swedish Fire Protection Association webpage, available at: https://www.brand-skyddsforeningen.se/brandsakerhet/skolan/ [Downloaded 10 January 2018].

Understanding schools as potential crime scenes and a place for risky situations

Schools are complex "places" in that they must be able to accommodate different styles of student–student and student–staff interaction. Things tend to cluster in certain parts of schools, meaning that some places within schools tend to hinder or facilitate certain styles of interaction. Clustered events are, however, not a thing or a collection of things; instead, they emerge in an assembled connection between the social and the spatial dynamic (see, e.g., Dovey & Fisher, 2014). Accordingly, dynamics of this sort circumscribe the way territories, boundaries, and identities are constructed in the intersection between the social and the spatial (cf. Dovey & Fisher, 2014).

Dovey and Fischer (2014) advance a perspective that is also strongly related to McLaren's (1999) work about adolescents' interactive states and interaction rituals. If, as McLaren (1999, p. 85 ff.) has proposed, interactive "states" constitute different "styles" of interacting with the environment on an everyday basis, in schools we can detect two states amongst the pupils: the student state and the street-corner state. Of these, the student state emerges, for example, during organized activities and in the classroom; during school breaks and school leisure time, however, the street-corner state dominates, and other rituals of interaction are evident (McLaren, 1999, p. 100). As a result, we need to examine and understand how different zones in school settings trigger or encourage different types of interaction, as well as how these interaction types relate to different forms of deviance. Crime is not random – it is either planned or opportunistic and tends to occur in places known to the offender (so-called "awareness spaces"), and the offender is also usually aware of the risks and rewards of the act (Kinney, Brantingham, Wuschke, Kirk & Brantingham, 2008).

Risky situations mainly unfold in everyday life settings, or, in major routine-activity nodes such as home, work, school, and places for leisure activities (Brantingham & Brantingham, 1981; 1993). They, moreover, tend to occur in the intersection between control challenges and processes, and life stage and crime encounters, and thus crime may be said to always be *situated*, in terms of situational inducements (see Felson & Eckert, 2018, p. 231). Consequently, in contrast to previous attempts to understand *why* an event occurs (analysis of motives), it appears to be more productive to understand *how* deviance occurs, at least insofar as the goal is to design effective situational prevention measures (cf. Clarke, 2009, p. 265).

CPTED as situational prevention

Before introducing the concept of Crime Prevention through Environmental Design (CPTED), I want to briefly outline the theoretical standpoints that make their presence felt in the "routine activity" approach (or routine activities theory, RAT), especially as regards the definition of "capable guardians" in relation to crime situations.

As already indicated, crime tends to occur in major routine-activity nodes (Brantingham & Brantingham, 1981), a fact that speaks of the important connection between crime and everyday life. While, originally in 1970s, RAT was developed to help explain factors in street crime, it is now accepted broadly as a general theory of crime. The theory holds that crime occurs when three elements convergence, namely the presence of a motivated offender and a suitable target in the absence of a capable guardians (Cohen & Felson, 1979). Capable guardians (which need not be people but can be, e.g., forms of informal or formal control) are of importance in prevention work, since what the proposed countermeasures aim to achieve is the restoration of any lack of control features. A capable guardian is someone or something that discourages deviance, although it is not any one single "thing". As both Felson (1986; 1995) and Eck (1994) have shown, the concept of the capable guardian may refer to highly different entities, such as guardians, handlers, or managers. Of these, guardians are people or devices that keep an eye on potential crime targets, while handlers keep an eye on potential offenders and managers merely monitor a place. From this we can then already conclude that for the handlers and/or managers to be successful in their task of crime discouragement, systematic thinking about the design of the place is required (Felson, 1995).

CPTED, which can be defined as a set of placed-based preventions strategies for reducing the frequency of crime events and increasing the degree of perceived safety, can provide exactly such systematic such thinking (Cozens, Hillier & Prescott, 2001). In school settings, the focus of CPTED has been on the design of the school building and/or the schoolyard, as there has been a clear need for the "proper design" of school spaces to reduce crime and increase safety in them (Fenelly & Perry, 2014, p. 319). However, proper design is hard to define, and various assessments become thus necessary in evaluating the specific context made up by the school building, the school property, and surrounding areas (cf. Crowe & Fennelly, 2014). The generalized use of CPTED in school settings is also limited by the fact that customized responses must be offered in relation the particular needs of each individual school (Watson, 2014, p. 21). Notwithstanding such reservations, in this article I venture a more general analysis of places where deviant behaviour occurs in schools.

Even if all schools have their own specific social dynamics, all deviant behaviour possesses some common features and characteristics (see Purpura, 2014, p. 11 ff.). This means that opportunities for deviance can be influenced by altering the degree of required effort, the risk of being caught, and the reward inherent in the given situation (Cornish & Clarke, 2003). Moreover, some of the criminogenic elements or traits in situations in school contexts reflect those of the physical environment in general – for instance, the proportion and degree of visibility/non-visibility, the presence of "owned"/"unowned" spaces, and avoidance/promotion of crowding (Felson, 1986; Astor, Mayer & Behre, 1999; Flaherty, 2000; Helbing, Buzna, Johansson & Werner, 2005).

Data and method

For this article, various previously published reports on assaults, bullying, or deliberate fire-starting in Sweden were analyzed by means of a qualitative meta-synthesis of findings. This section describes the data collection procedure, the analytical techniques utilized, and ethical considerations related to the study.

Data collection

The examined reports, which were published between 2009 and 2016, were collected from the websites of the following pre-identified stakeholders during Spring 2017: PrevU (local data from Gothenburg about bullying), Friends (a non-profit engaged in bullying prevention), the Swedish National Council for Crime Prevention, the Swedish National Agency for Education, and the Swedish Civil Contingencies Agency. The inclusion criteria for the reports represented a combination of stakeholder criteria and report quality criteria centred on the following four conditions:

a. The stakeholders had to be agents actively working with prevention in a relevant area or field;
b. this work had to be pursued at a national level and the reports needed to cover more than a single school;
c. the reports needed to consider not only social but also spatial factors (involving places of occurrence); and
d. the reports needed to exclusively focus on indoor events during daytime (when the majority of students would be in school for regular activities), to enable an analysis situated in the function of place at regular "school hours".

Using these criteria, a total of ten reports were collected from the above five stakeholders (Appendix A).

Analytical techniques

The reports were analyzed with the help of a qualitative meta-synthesis. A meta-synthesis goes beyond primary studies, leading the analytical process to become larger than the sum of its parts, transforming the data in the process (Barnett-Page & Thomas, 2009). Because data are re-analyzed with a new question in mind (Thorne, Jensen, Kearney, Noblit & Sandelowski, 2004), meta-synthesis is distinct from mere cumulative logic. In the case of this study, a thematic synthesis was conducted in three stages, involving line-to-line coding, descriptive themes, and analytical themes. The line-to-line coding was in the interest of translating and interpreting concepts, and the descriptive themes – for example, the distinction between un-owned and owned places, differences between student social roles, etc. – were generated from these concepts (cf. Thomas & Harden, 2008). When the analytical themes, which can be described as "third-order interpretations", became apparent, the study's research questions could be addressed. In a first step, the questions were addressed in relation to spatial factors through the identification of hotspots. In a second step, the manifest or latent socio-spatial conditions related to the events were re-constructed, to explain internal variation between hotspots (cf. Heaton,1998; Weed, 2005; Barnett-Page & Thomas, 2009). In the third and final step, the analysis was aimed at linking the offender and the opportunity structure for the events to school design features, to identify avenues for effective place-based prevention (cf. Patton, 2002, p. 459).

Ethical aspects

The study drew upon published secondary data in the public domain; as such, the only ethical considerations pertained to the anonymization of the schools named in the reports. The study concerned itself with places or locations within schools and not any particular or specific schools (cf. Ivert, Mellgren & Nilsson, 2017).

Analysis and results

The results of the study are presented here in the same order in which they were featured in the analysis. First, the identified general hotspots are described; second, an interpretation of the differences between hotspots in terms of deviance types and offender ages is offered; lastly, the analytical links between offender, opportunity structure, and school design is elucidated from a prevention point of view.

General hotspots in schools

In the analysis, three general hotspots emerged in which major events were seen to cluster in schools. These were restrooms, hallways, and student lounges (Figure 1).[3] The hotspots shared the same criminogenic factors related to place and the social interaction states of students in school settings.

3   Note that the results shown in Figure 1 do not represent the actual number of incidents, but are a summary of the frequency with which the different locations were mentioned in the reports (i.e., there is no equidistance in any statistical meaning between the different locations, only in a qualitative sense, since these areas are interpreted as hotspots or frequent locations in the reports).

To begin with, the criminogenic factors related to place were related to restrooms, hallways, and student lounges, all areas characterized by a low degree of ownership. Such spaces also facilitate visibility between students and non-visibility between students and staff, and tend to be crowded before, between, and after classes (cf. Felson, 1986; Astor et al., 1999; Flaherty, 2000). Secondly, each of these three places of occurrence maintain specific rules for student interaction. As McLaren (1999, p. 95) has pointed out, different functional arenas are accompanied by different expectations about people's social roles, and for the particular settings involved here the expectations were those of street-corner interaction instead of adherence to a more student-like role. Street-corner interaction, for McLaren (1999, p. 86–87, 94), enacts interaction patterns characteristic of life outside school, manifested in verbal and/or visualized performance (e.g., talking, gestures).

Figure 1
General hotspots: the clustered spatial relationship of hotspots to all of the types of deviance identified in the reports, with incident values calculated from the middle towards the edges.
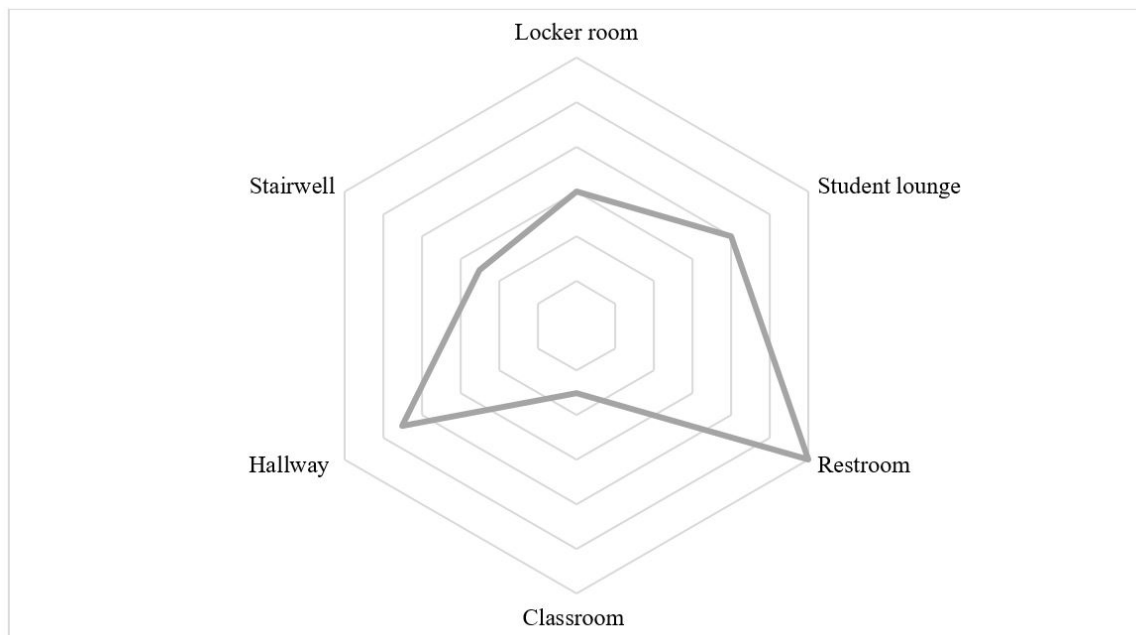
The designed function of the hotspots also played a role in facilitating the criminogenic traits and invoked interaction states, and the interaction of these two. The hallway and student lounges are transitional spaces between two confined spaces, making their behavioural rules, as well as expectations and uses of the space unclear. This facilitation became even more obvious when the hotspots were compared with lower-risk areas such as classrooms and school canteens. In the latter, for example, both the student mode of interaction and the room function were both very clear at the level of both expectations and performance (structured activities). Canteens are also to some degree "controlled" by school staff members. Accordingly, they afford a high risk of being detected and a low degree of anonymity. In contrast, both student lounges and

hallways are places for transitions and unstructured activities, and in them students act not only in their capacity as students, but also as peers. In such spaces, the degree of external control also tends to be rather low. Altogether, the circumstances at play in these places results in a higher propensity for crimes to occur in them, as the risks of detection are low while the risks of provocation and also the degree of anonymity are high from an offender point of view (cf. Cornish & Clarke, 2003).

Spatial distribution of specific deviance types

Comparing the places where different forms of deviance (assaults, bullying, deliberated fire-starting) occur revealed a particular spatial distribution, the variations in which were clearly also related to age.

As seen from Table 1, deviance in this study tended to have an age-specific pattern, with primary schools showing more variation in deviance compared to upper secondary schools. This pattern may have been caused either by limitations in the data (e.g., there were more reports and research on deviance concern primary school settings) or the simple possibility that age matters for deviance in school. Indeed, previous research has found the latter to often be the case, with crime rates rising steeply in late adolescence to then quickly drop again in people's early 20s (Hirschi & Gottfredson, 1983; Gottfredson & Hirschi, 1990). This age pattern is, moreover, especially pronounced in deviant behaviour that can be categorized as criminal mischief, including vandalism, petty theft, and arson (Laub & Sampson, 2003), lending plausibility to the importance of age.

Table 1
Distribution of deviant events in Swedish primary, lower secondary, and upper secondary schools (x signifies occurrence of deviance related to age).

	Primary school (ages 6 to 12)	Lower secondary school (ages 13 to 15)	Upper secondary school (ages 16 to 19)
Assaults	–	X	–
Bullying	X	X	–
Deliberate fire-starting	X	X	X

From Table 2, we can see that even if the incidence pattern might be age-specific, the spatial distribution of the events shows some similarities between the different age groups (school categories). The main hotspot for assaults was hallways, with just a few reports also mentioning student lounges and stairwells. The common socio-spatial feature in all these three places is their risk in relation to becoming crowding or forming bottlenecks. This not only allows for anonymity and brings a low risk of detection, but also increases the risks of provocation, escalation of conflicts, and peer-pressured violent encounters (cf. Cornish & Clarke, 2003; Felson & Eckert, 2018, p. 232 ff.). Moreover, what likely only aggravates those tendencies more is the nature of the place itself, which

invites street-corner behaviour more than any other behaviour, and therefore dominating the situated solutions at hand (cf. McLaren, 1999, p. 100; Helbing et al., 2005).

Table 2
Spatial distribution (hotspots) of deviance in primary and upper secondary schools.

	Primary school (ages 6 to 12)	Lower secondary school (ages 13 to 15)	Upper secondary school (ages 16 to 19)
Assaults	–	Hallways	–
Bullying	Locker rooms Restroom	Locker rooms Restroom Hallways	–
Deliberate fire-starting	Student lounges Restrooms	Restrooms	Student lounges Restrooms

In contrast to assaults, which in the reports were only mentioned in connection with the age group 14 to 16, the age and spatial distribution characteristics of bullying showed a more spread-out pattern. Incidences of bullying appeared also to be related to the dichotomy of visibility vs. non-visibility. For example, bullying in primary schools (the youngest age group) was mostly concentrated in locker rooms and restrooms, although some of it also occurred in classrooms and in hallways. In the lower secondary school, bullying tended to only occur in hallways, locker rooms, and restrooms. This pattern suggests two things. First, for the youngest age group, the visibility of victims may have been what triggered the situation. Second, the spatial aspect of bullying seemed to facilitate the visibility of the victim and the non-visibility of the offender to adults, occurring as it did mainly in "private" places such as restrooms and locker rooms. Hallways, in contrast, represent the opposite of the two other hotspots, being characterized by a high degree of visibility. Still, the visibility effect might not have been so decisive, since hallways tend to be crowded during breaks, which heightens the degree of anonymity (cf. Cornish & Clarke, 2003).

Compared to the other forms of deviance in this study, the deliberate fire-starting incidents analyzed had a lower degree of spatial variation in their pattern. This suggests that fire-setting may be more strategic or instrumental as an act, compared to assault and bullying. Moreover, there were no reports at all of those in the youngest age group (aged 6–10) committing fire-setting acts, which may reflect the fact that starting a fire requires more planning compared to committing an assault or bullying someone. Overall, fires tended to be started in restrooms or student lounges, showing a similar modus operandi, targeting rubbish bins

or public message boards. This manner of proceeding was facilitated by place-designated functions in terms of hot products (easy access to products to misuse). In addition, the places in question also promoted a high degree of non-visibility, exhibiting very likely a low degree of adult presence as well.

Linking offender decision and opportunity structure to school-house design to prevent deviance

In most reports, the identified offender was a student, who thus represented an "internal threat". For this particular reason alone, the three types of deviance examined above are difficult to prevent using conventional target-hardening approaches such as access control. Instead, preventive strategies need to reduce opportunities. Opportunities do not, however, only emerge from the offenders' personal traits or personal motivation; they are also situated in time and place (Felson & Eckert, 2018, p. 214). As previous research has shown, most deviance occurs when the opportunity structure renders the act easy and/or tempting to carry out, with the most tempting opportunities, moreover, tending to cluster at particular places (Sherman, Gartin & Buerger, 1989; Ratcliffe, 2004; Eck, Clarke & Gurette, 2007).

In this analysis, the spatial distribution of deviance, however, was found to not only reflect the different social roles enacted in schools, the distinction between instrumental and expressive crime (in the degree of planning), or the way different places facilitated different events. It was also connected to three other important criminogenic elements related to place: high degree of visibility for suitable targets or victims, low offender efforts, and risks (cf. Kaplan, Kane, Lavrakas & Pesce, 1978; Cornish & Clarke, 2003). The role of the physical environment, and thus its design, can thus be used to reduce opportunities for deviance, for instance through strategies that (i) help bring a better balance between visibility and non-visibility, (ii) increase the offender effort required as well as the risk of being caught, or (iii) enlist place-based strategies to facilitate the presence and effectiveness of guardians, handlers, and managers in schools (cf. Felson, 1986; 1995; Eck, 1994). Moreover, as the analysis above indicates (in line with Astor et al., 1999), un-owned places appear to be of particular importance from the prevention point of view. These can be interpreted as spaces in schools without structured activities, which as a result foster street-corner interaction and are characterized by a low degree of control. While previous studies have focused upon the emergence of violent situations in un-owned places (e.g., Astor et al., 1999), in this study one could observe all three of the types of deviance considered to cluster in such spaces (hallways, locker rooms, restrooms, and student lounges).

As Astor et al. (1999) have pointed out, students often experience un-owned places, or undefined space in schools, as "abandoned" by adults,

which not only results in a lack of surveillance, but also signals ineffective rule-setting and a lack of consequences for misbehaviour. To diminish the likelihood of deviant situations in schools, un-owned places need to first be recognized, then transformed into "owned" places with designated functions. For example, where hallways create opportunities for assaults and bullying because they promote anonymity, crowding, and bottlenecks, they need to be re-designed so that they create a more even flow of people, or a mixed flow, for example by making teachers and/or other school staff use the hallway to reach work areas. Doing so will reduce anonymity in such places and contribute to more natural surveillance (both student–student and teacher/staff–student surveillance). In addition, to help increase self-regulation and reinforce school values, hallways can be designed to facilitate place management, or to remove excuses for deviance through symbolic signage, for example through the use of text on walls reminding students about expectations and rules.

Compared to public places in schools, finding design solutions for more "private" area such as locker rooms and restrooms is more of a challenge. Both locker rooms and restrooms are designed to maintain a high degree of student privacy. While the means to achieve this have included providing a low degree of teacher/staff surveillance, the result is space that affords opportunities to confront others, bully people unnoticed by others, and start a fire. No general solution can be identified that will be able to deal with all of these cases. Instead, the solution or prevention strategy needs to be developed in the local context, for the local context, by analyzing the specific school and its unique circumstances and preconditions. At the same time, however, one general suggestion here might nonetheless be to consider whether there could be a possibility to design or re-design locker rooms as fully private areas offering the possibility, perhaps, to change and shower in smaller, "safer" rooms.

In conclusion, school design and design features need to be aimed at discouraging crime by facilitating guardianship, management, and handling (cf. Felson, 1995). As noted previously, the degree of anonymity and the extent of informal or "natural" surveillance are two key elements in this regard that architecture or design can tackle. In addition, the number of confrontation zones in a school can be reduced by means of both exterior and interior schoolhouse design, by subdividing these places and transforming them into owned places by clearly signalling their intended new use. One way to accomplish this may be to re-design the combination of different functions (teacher's lounge, student lounge, restrooms) to create a forced flow through the space, with teachers and staff made to pass through hotspot areas frequently in the course of the day as assigned handlers in case something occurs. At the same time, it is also important to find the right balance in school buildings between formal and informal surveillance, since too high a degree of formal control or security can affect students' sense of safety negatively and cause

them to begin to react to certain places with fear and/or avoidance or, in the worst case, only more deviance as their personal or collective response to too much or too strict control (cf. Addington, 2009).

Discussion

The aim of this article has been to explore whether architectural practices of school design offer an effective preventive strategy in reducing deviance in school settings, by addressing general and specific hotspots, interpreting such hotspots in their socio-spatial context, and narrowing down the physical elements shaping the opportunity structures that influence occurrence and prevention. As seen from the analysis, hotspots were in the first place created and clustered in un-owned places (hallways, student lounges, locker rooms, and restrooms),with deviance emerging in the intersection between unstructured activities, student street-corner interaction, and places characterized by a high degree of anonymity combined with a low offender effort and low risks (socio-spatial context). The following criminogenic socio-spatial elements emerged as common traits for assaults, bullying, and deliberate fire-setting: a low degree of ownership, risk of crowding, and a lack of balance between visibility and non-visibility, all of which can be impacted by architectural practice and school design. Suitable strategies therefore seem to be those capable of discouraging deviance by implementing a greater sense of ownership over places and steering clear of criminogenic place-based elements that facilitate crowding, anonymity, and low offender effort. In other words, place itself is of importance in enabling deviant acts in combination with social performances, while architecture and design can constitute successful strategic tools in reducing the incidence of such acts.

Contemporary challenges and architectural praxis

Sweden, unlike the other Nordic countries, still does not have any agency to assist in the dissemination of research findings concerning schools as physical learning environments (Swedish Association of Local Authorities and Regions [SKL], 2018), despite the clear importance of place, design, and the physical environment both in relation to deviance and for students' general well-being and achievement levels in schools (see, e.g., Higgins et al., 2005; Armitage, 2006; Atlas, 2013; Crowe & Fennelly, 2014; Isling Poromaa, 2016). At the same time, schools continue to need to be built in the country, perhaps even in greater numbers than previously, while architects need to tackle an increasing number of challenges such as those posed by the "the principles of new urbanism" in terms of localization and integration of schools in the dense city (The National Board of Housing, Building and Planning, 2017), new school reforms (The Swedish National Agency for Education, 2015; Angelov & Edmark, 2016), and new complex pedagogical and technical encounters, which all, directly or indirectly, can affect safety, security, and the occurrence of everyday

deviance. As suggested by both this study and previous research, architecture as the design of the physical environment can help prevent deviance in schools, by elucidating which environmental factors are crucial to that task. As this analysis also indicates, a mere combination of criminogenic elements in one individual is not enough to bring about deviant behaviour; the physical environment itself is an important factor in the dynamic in which the opportunities for deviant behaviour are created. To borrow the insight of Sherman (1995), places, too, can have criminal careers, with components analogous to the criminal careers of individuals.

Similar to the findings of a study of violence in schools by Astor et al. (1999; 2006), this study too identified a bi-directional influence between place and deviance. This bi-directional relation is related to certain socio-spatial conditions, which can explain why some locations are viewed as "violence-prone because violence has occurred there", even though "violence tends to occur in specific areas because those locations are associated with specific social characteristics" (Astor et al., 1999). For architecture to succeed as a prevention strategy, a specific way of thinking, analyzing, and planning the design of schools is needed, whereby the relationship between human, object, and context can be examined and analyzed more carefully (cf. Love, 2002). This also emphasizes the need to recognize and assess what proper design means for schools-to-be, based on an understanding of the local context, the risks, and the interrelationship between the design of a school and its social organization (cf. Fennelly & Perry, 2014; Purpura, 2014; Watson, 2014). As Collins et al. (2004) have stressed, it is important to understand that each design implementation in educational settings is unique, and that the design might also become modified in the process. Moreover, design processes need to be synchronized with the way the school organizes its day-to-day activities. Thus, the intended and actual use of the school can be clarified and modified by means of design features that facilitate desired outcomes. As previous research has concurred, place-based interventions cannot just focus on mere formal or mechanical standard solutions without genuinely taking local context into account (Cozens, 2008; Welsh & Farrington, 2009, p. 8 ff.; Reynald, 2011). Moreover, allowing architects to take part in the discussions about how to distinguish between "real" risks and "perceived" risks enables them to make more balanced decisions and design that can actually prevent deviance (cf. Benbenishty & Astor, 2008; Crowe & Fennelly, 2014), instead of merely placating stakeholders' or clients' expectations or beliefs (cf. Gutman, Cuff, Wriedt & Bell, 2010, p. 215 ff.).

Limitations and suggestion for further research

This study has three main limitations. One is related to a common misconception about its theoretical framework, while the other two relate to the data collected and drawn upon for the analysis.

A common misconception concerning rational choice-influenced theories as employed in situational prevention (e.g., RAT, environmental criminology, and CPTED) is that the research tradition only addresses symptoms and not the causes of deviance, by ignoring the individual predisposition for deviance. However, the opposite can also be argued, since the predisposition of an individual are of great importance in situational analysis, and thus people are understood to commit crime based on what they perceive and choose in a specific situation (cf. Wikström, 2014, p. 75). This focus on the *causes of action*, instead of the *causes of causes* in situational prevention, also highlights the convergent elements in deviance, such as individual, place, and temporality (cf. Cornish & Clarke, 2003; Wikström, 2014; Felson & Eckert, 2018). This also shows the value of CPTED and other similar situational strategies in integrating architecture and design processes as effective risk management strategies (cf. Clarke, 2009, p. 269 ff.; Weisburd, Farrington & Gill, 2017).

A second limitation of this study relates to the data, or, certain problems in analyzing secondary data in a valid and generalizable way. The materials used for this study (i.e., the published reports) were not primarily constructed to yield data about place for deviance studies; their expressed aim was to map mainly social aspects of deviance and certain trends. Any mention of a place of occurrence of deviant behaviour in the reports was often very cursory only, possibly causing bias in the analysis. One example of this is made visible in Table 2 above, which shows that none of the reports discussed places of occurrence in connection with assaults and bullying in upper secondary schools; indeed, it remains unclear whether these even exist. In addition, in most reports the place of occurrence was not stated in relation to the phenomena of interest, since the focus was on the offender and not place of occurrence. This resulted in a low *n*, making it impossible to generalize on the results based on the empirical evidence. Instead, the validation could only be done by theorizing on the results. To manage these limitations and minimize their adverse effects, the analytical model and the research questions in this study were kept flexible enough to narrow down what was feasible and then present it in as convincing as possible a way.

As proposed above, there are good reasons to study places of deviance and develop place-based interventions for schools. To actually enable that, however, three things must be considered: theoretical development, systematic analysis, and the involvement of stakeholders. First of all, developing a new theoretical framework combining criminology, architecture, and architectural practice is necessary in order to enable systematic research, implementation, and evaluation of place-based preventive strategies (cf. Ekblom, 2010, ch. 8; Armitage & Monchuk, 2017). Secondly, instead of focusing on only one part or the other, there needs to be more systematic analyses of the particular bi-directional relationships that unfold in school settings where social factors and

deviancy-prone locations exercise their influence jointly and simultaneously (cf. Astor et al., 1999). Finally, there is also a need to ensure that research in the field of architectural practice is conducted in close cooperation with actors in schools, and that general and local aspects of the physical, organizational, pedagogical, and social environment offered by schools are thereby acknowledged (cf. Love, 2002).

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Appendix A: Included reports (N=10).

Publication year	Theme	Author/Organization[1]	Name of the report	Quality of report[2]	Data structure in the report[3]
2009	Bullying	PrevU, Social resource management, Gothenburg City	About bullying. Retrieved from Olweus student survey about bullying from 18 schools in Gothenburg [Om mobbning. Hämtad från Olweus elevenkät om mobbning från 18 skolor i Göteborg]	++	Local, self-reported data
2009	Violence	The Swedish National Council for Crime Prevention and Swedish National Agency for Education	Serious violence in school [Grövrevåld i skolan]	+	National research summary
2011	Deliberate fire setting	Swedish Civil Contingencies Agency	National action plan to strengthen school fire preventive work. [Nationell handlingsplan för att stärka arbetet mot bränder i skolmiljö]	++	National action plan
2011	Deliberate fire setting	Andersson, B., Lundqvist, M., Jonsson, A., Sundin, S., Gell, T. Andersson, R. Founded by Swedish Civil Contingencies Agency and University of Karlstad	Which schools have an increased risk of fire? Consolidation of data from the Input Report Database and the School Registry [Vilka skolor har en ökad risk för anlagd brand? Samanvändning av data från Insatsrapportdatabasen och Skolregistret]	++	National research
2012	Deviance (general scope)	The Swedish National Council for Crime Prevention	Preventing crime and behaviour problems in school [Idéskrift 19. Att förebygga brott och problembeteenden i skolan]	++	Local research summary
2013	Bullying	Swedish National Agency for Education	Violations of persons in the school environment: Problems and solutions [Kränkningar i skolan - analyzer av problem och lösningar]	+++	National research summary
2015	Deliberate fire setting	Persson, S., Uhnoo, S. Department of Sociology and Work Science, Gothenburg University. Founded by Swedish Civil Contingencies Agency website	Fire setting in Swedish Lower Secondary Schools: The problem, its causes, and countermeasures [Brandutsatta högstadieskolor. Problembilder, orsaker och åtgärder]	+++	National research
2015	Bullying	Friends	Friends report 2014 [Friendsrapporten 2014]	+++	National self-reported data
2016	Bullying	Friends	Friends report 2015 [Friendsrapporten 2015]	+++	National self-reported data
2016	Deviance (general scope)	The Swedish National Council for Crime Prevention	School Survey on Crime 2015 [Skolundersökningen om brott 2015]	+++	National self-reported data

1   Note that author and organization can include both authorities independently publishing reports, and reports conducted at Universities founded by authorities. The scope also include PrevU:s (municipality focus) and Friends (non-profit organization) report on bullying since they discuss place in relation to bullying which no other report does. In addition both PrevU and Friends reports are based on self-reported data from students, which handle some of the issues in official reports regarding hidden statistics.

2   Quality of reports are judged by presence of place variables in the reports, + signifies a low degree of place variables and +++ a high presence of place variables useful for the analysis and not on academic quality in terms of method, scope and so on.

3   Data structure in the report (divided between national and local data, research summaries, conducted research and self-reported data).

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Charlotta Thodelius has a MA in Criminology and a PhD in Architecture. The article presented here was conducted as a part of her dissertation research project. The dissertation – Rethinking Injury Events (2018) – aimed at new insights into adolescents' injury events and contributed to the development of situational preventive measurements, mainly by modification of the physical environment. The conducted PhD-project was founded by the Swedish Civil Contingencies Agency (Myndigheten för Samhällsskydd och Beredskap).