Unravelling college students' fear of crime

The role of perceived social disorder and physical disorder on campus

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UNRAVELLING COLLEGE STUDENTS' FEAR OF CRIME: THE ROLE OF PERCEIVED SOCIAL DISORDER AND PHYSICAL DISORDER ON CAMPUS

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ABSTRACT: The current study explores the role of individual and environmental determinants on students' fear of crime. Based on a large-scale survey among students of a Belgian university (n = 1,463), the relationship between perceived social and physical disorder and the three dimensions of fear of crime (perceived risk of victimization, feelings of anxiety, avoidance behaviour) is examined. Support was found for a relationship between perceived social and physical disorder and perceived risk of victimization. Moreover, a relationship was found between students' perception of social disorder and anxiety and students' perception of physical disorder and avoidance behaviour. Based on the results, this study suggests that preventing or reducing visible signs of disorder on campus should inevitably be included in the university's security policy. This research offers universities more insight in the determinants of students' fear of crime and potential measures to increase their (perception of) safety.

Keywords: fear of crime, higher educational institutions, campus security, social disorder, physical disorder

1. INTRODUCTION

While campuses are often seen as environments that are immune for crime, previous studies (Jennings *et al.*, 2007; Paulson and Scherer, 2007; Woolnough, 2009) evoke questions about this status of a safe haven. Research has shown that crimes such as vandalism, physical violence or sexually undesirable behaviour are prevalent in higher educational institutions. The high student population, the prevailing freedom, lack of guardians and homogenous nature of the campus setting create an environment with opportunities for crime to occur (Petherick, 2000). Moreover, the open structure of university campuses and the easy access through public roads may contribute to the perception of risk (Gomme and Micucci, 1997; Rasmussen and Johnson, 2008). Although

empirical data suggest that college campuses are more secure than the communities in which they are located (Baum and Klaus, 2005; Hart, 2003; Shariati and Guerette, 2019), students may feel vulnerable and at risk for being victimized.

In the past decades, authors focused on students' perceptions on their risk of victimization by referring to the concept 'fear of crime' (Bohmer and Parrot, 1993; Brown and Andy, 2007). Recent findings show that approximately one-quarter of students reported to experience fear of crime on campus (Maier and DePrince, 2020; Robinson and Roh, 2013; Sani et al., 2019). Fear of crime can be considered as a complex phenomenon that can be influenced by different variables. In a campus environment, numerous studies have shown that students' individual characteristics, such as gender, age or nationality, may strengthen or reduce fear of crime (May and Dunaway, 2000; Tomsich et al., 2011). Moreover, earlier experiences with victimization could make students more fearful (Lee and Hilinski-Rosick, 2012; Maier and DePrince, 2020). To date, limited efforts have been applied to understanding the influence of environmental features of campuses on students' fear (Hibdon et al., 2016). Research conducted in other contexts, for instance in communities and neighbourhoods, suggest that environmental cues, such as the presence of disorder, can have a significant impact on individuals' fear of crime (Franklin et al., 2008; Hardyns et al., 2019). Studies indicate that certain areas can send signals that can cause people to develop feelings of anxiety (Scarborough et al., 2010; Steinmetz and Austin, 2013). Many environmental dynamics that generate fear of crime in community contexts, may also occur on campus. Scholars state that college campuses can be considered similar to communities as they have three components in common: a fixed geographic location, common ties among students, faculty and other people and many social interactions (Mansour and Sloan, 1992; Poplin, 1979; Sloan et al., 1996). Still, a campus may also have characteristics that are not typically found in a community, which could reduce students' fear of crime. However, because of the limited research on the influence of perceived disorder on fear of crime in a campus setting, the specifics of fear generating processes on campus are uncertain (Sloan et al., 1996).

An overview of the literature shows that most studies on fear of crime on campus were conducted among American college students. While there exists a large body of scientific research on topics such as the prevalence of sexual assault (Klein and Martin, 2019), the impact of school shootings (Kaminski et al., 2010) and the effect of security legislation (Janosik and Gehring, 2003) on American campuses, caution is needed to extrapolated the conclusions of these studies to European universities (Sani et al., 2019). Contrary to European universities, campuses in American countries are characterized by large populations of students living on campus and spending their free time on campus (e.g. in fraternities and sororities, campus gyms, campus restaurants) (Huesman

et al., 2009). Moreover, empirical evidence shows that there are differences in victimization rates between American and European countries. For instance, a comparative study of Fisher and Wilkes (2003) showed that English college students reported slightly higher rates of victimization (37.5%) compared to American students (36.1%).

Therefore, the current research has the aim to fill a gap in the literature by examining the role of perceived social and physical disorder on students' fear of crime on campus in a non-American context. By conducting a large-scale survey among students of a Belgian university, a better understanding of the influence of environmental cues on students' risk perception, feelings of anxiety and avoidance behaviour will be provided. Based on the results of this study, suggestions for universities to reduce students' fear of crime will be provided.

2. FEAR OF CRIME ON CAMPUS: A LITERATURE REVIEW

Campuses are public spaces where students and staff members are studying, working and living close to each other. The daily campus activities create an environment where many people function in a close proximity to criminal offenders (Robinson and Mullen, 2001). While security can decrease the risks of becoming a victim, it is almost impossible to monitor all individuals working or visiting the campus. This implies that it is realistic that students become victimized or report higher levels of fear of crime (Paulson and Scherer, 2007).

In previous research, authors often measured fear of crime by referring to the emotional aspects of individuals' feelings of anxiety. In this light, the question 'How safe do you feel or would you feel being alone in your neighbourhood at night?' and a parallel question for 'during the day?' have long served as the standard measurement method. Criminologists Ferraro and LaGrange (1987) were one of the first researchers who criticized this narrow view and emphasized on a multidimensional approach. Since the remarkable publication of the authors, three main dimensions of fear of crime are distinguished: a cognitive dimension, or the risk perception of crime victimization; an affective or emotional dimension, or the experienced fear of more general feelings of, or concerns about security; and an expressive dimension, or the behavioural attitudes or measures taken in response to feelings of fear (Hardyns and Pauwels, 2010).

With perceived risk, authors refer to the individual's perception of the likelihood that they will become a victim of a crime (Rader *et al.*, 2007). Numerous studies found a one-way relationship between risk perception and feelings of anxiety (Ferraro and LaGrange, 1987; Warr and Stafford, 1983). Ferraro (1995) even argued that perceived risk can be considered as the strongest predictor of anxiety. Regarding the campus environment, a majority of studies, which were conducted among students of American universities and colleges, suggest that a difference can be made between perceived risk during the day and at night. For instance, Tomsich *et al.* (2011) concluded that

students' perceived risk of victimization at night was almost double of their perceived risk during the day. Moreover, gender differences have been found. Jennings *et al*. (2007) concluded that females perceived higher levels of risk compared to males. Fisher and Sloan (2003) also found higher levels of perceived risk for female students, both during the day and at night. Other studies provide evidence that gender differences in perceived risk are dependent on the type of crime. For instance, Reid and Konrad (2004) found that women had lower levels of perceived risk for robbery than men but showed higher levels of perceived risks for sexual assault and burglary.

As a continuation of the growing research on perceived risk and feelings of anxiety on campuses, authors began to examine the behavioural changes originating from these feelings (Hibdon *et al*., 2016). With constrained behaviour, researchers refer to behavioural adaptations that individuals make when they have the perception that there is a possibility of crime and they want to reduce the victimization risk. These constrained behaviours include avoidance behaviours (e.g., avoiding certain areas or classes in the evening) and defensive (or protective) behaviours (e.g., carrying keys in case of self-defence or asking someone to walk with you) (Ferraro and LaGrange, 1987). Studies have shown that students who express high levels of fear report more avoidance and defensive behaviours (Wilcox *et al*., 2007; Woolnough, 2009). For instance, Tewksbury and Mustaine (2003) found that 22% of American students indicated that they carry a mace for self-protection while 17% reported to carry a gun to the university. McCreedy and Dennis (1996) concluded that 27% of students of East Carolina University (United States) avoid following classes after dark because of their feelings of anxiety. Prior studies have indicated that women tend to report engaging in higher levels of avoidance behaviour, while men are more likely to engage in defensive behaviours (Jennings *et al*., 2007; May *et al*., 2010; McCormick *et al*., 1996).

Individual Factors

As previous research indicated, individual characteristics can contribute to the experienced level of fear (Schreck and Miller, 2003). Numerous authors emphasize on age and gender differences in fear of crime, both in the general population and among university students (Fisher, 1995; Jennings *et al*., 2007; Woolnough, 2009). Studies have shown that people who are less able to protect themselves from crime, such as female or younger students, experience higher levels of fear since they consider themselves as more vulnerable to become a victim (Alvarez and Bachman, 1997; McDevitt and Panniello, 2005; Schreck and Miller, 2003). Fox *et al*. (2009) found that female students at a southeastern American university experienced more fear of crime at the campus in comparison to male students. Fisher and Sloan (2003) considered gender as the

strongest predictor of fear of crime and found that women reported higher levels of fear on another American campus.

Additionally, previous studies showed that younger college students express more fear of crime than older peers (Fisher and Sloan, 2003; Kaminski *et al.*, 2010). Patton and Gregory (2014) found that younger students, those from 18 to 24 years of age, generally felt safer while on campus than did their older counterparts. Kaminski *et al.* (2010) concluded that after the Virginia Tech and Northern Illinois University shootings, younger students indicated to be more fearful of crime on campus (Kaminski *et al.*, 2010). May and Dunaway (2000) focused on the grade level of students instead of their age and also found that grade level is inversely related to fear. Hibdon *et al.* (2016) explain these differences due to the fact that younger students may be more afraid of crime because they have been on campus for a shorter duration of time and are less familiar with the campus environment.

Furthermore, studies have shown that experiences with previous victimization can increase the level of students' fear of crime. Researchers have distinguished between the impacts of direct and indirect victimization. The direct victimization model establishes a link between fear of crime and the experience of being victimized in the past (Dull and Wint, 1997; Skogan and Maxfield, 1981). Overwhelmingly, studies show that crime victims are significantly more likely to fear crime than non-victims. For instance, Fox *et al.* (2009) concluded that victims of theft and stalking reported to be more fearful of crime on campus than students who did not become a victim. Bedenbaugh (2003) also found that prior experiences with victimization had a significant impact on students' fear of crime on campus. Other authors have found a very weak or even no relationship between victimization and fear of crime. For instance, Jennings *et al.* (2007) found no impact of previous victimization on fear of crime at the university campus.

The indirect victimization model, or vicarious victimization model, assumes that people who have not been victimized personally but have been exposed to others who have, can experience higher levels of fear (Fox *et al.*, 2009). Del Carmen *et al.* (2000) found that after an incident of sexual assault on campus, the percentage of students that reported to be fearful of crime increased from 32% to 41%. Schreck and Miller (2003) also found that vicarious victimization heightens feelings of fear on school. Although many studies have found support for the impact of indirect victimization on fear of crime, some studies indicate that those who experience victimization vicariously are not more likely to be fearful of crime than those who do not (Fisher, 1995; Fox *et al.*, 2009). Despite the mixed relationship between victimization and fear of crime, researchers have pointed out that it is part of a more complex issue which involves many other factors which take into account the larger social and physical aspects of campus life (Austin *et al.*, 2002; Skogan and Maxfield, 1981).

Environmental Factors

Besides individual risk factors for fear, environmental cues may also matter in the perception of safety. The presence of physical or social disorder which alert people to possible criminal victimization would inform the belief that victimization is likely to happen (Barberet and Fisher, 2009; Warr, 2000). Disorder can be considered as violations of community standards, which can be expressed by social disorder, such as the presence of people who are drunk or fighting, or physical disorder, such as the presence of vandalism or dirty spaces. Individuals may consider disorder as visible signs of crime indicating that dangerous elements are present, and their personal safety might be compromised and threatened (Fisher and May, 2009).

The link between perceived disorder and fear of crime originates from the Chicago School and has been expressed more clearly in the Broken Window Theory. This theoretical framework indicates that visible symbols of disorder make neighbourhoods vulnerable to criminal offences (Wilson and Kelling, 2003). Visual cues of disorder, such as graffiti, public intoxication or garbage, can signify to criminal offenders that residents are indifferent of what goes on in the neighbourhood and lack the social cohesion that is needed to hinder crime (Sampson and Raudenbush, 2004). More complex is the relationship between fear of crime and community crime rates. Some scholars argue that fear of crime does not necessarily correspond to the actual risk of victimization but is instead an individuals' subjective estimate of the certainty of being at risk of victimization based on an interpretation of the situation (Cook and Fox, 2011).

Most of the research on disorder and fear of crime has focused on the community setting rather than university campuses (e.g., Hardyns *et al.*, 2019; Scarborough *et al.*, 2010). Wilson and Kelling (1982) were the first researchers to argue that the presence of physical of social disorder in neighbourhoods is directly linked to greater fear of crime. More recent studies support this finding and indicate that individual perceptions of neighbourhood disorder appear to be the most powerful determinants of both the cognitive and emotional dimensions of fear of crime (Franklin *et al.*, 2008; Hardyns *et al.*, 2019). Other researchers have argued that disorder indirectly affect feelings of anxiety through elevated perceived risk of victimization (Ferraro, 1995; LaGrange *et al.*, 1992; Rountree and Land, 1996). Regarding the campus environment, some research has found that community disorder extends to fear of school-related crime (May and Dunaway, 2000). Alvarez and Bachman (1997) found that the presence of gangs and the perceived availability of drugs and alcohol had an impact on fear of crime of students. Sloan *et al.* (1995) and Fisher (1995) reported that a relationship exists among fear of crime and perceived social disorder on campus. Based on these findings, the conceptual model as shown in Figure 1 was developed.
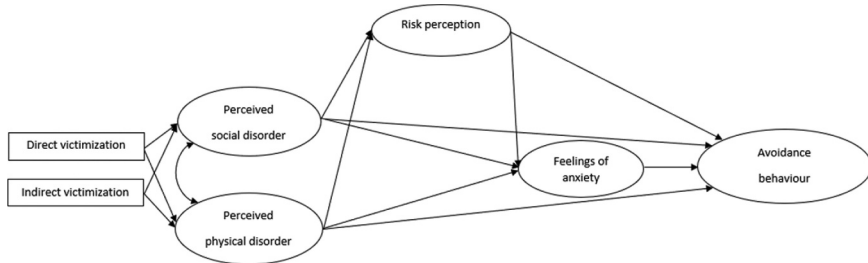
Figure 1. Conceptual model of the determinants of avoidance behaviour. Note: gender and study years were added as covariates for all variables

3. METHOD

Research Setting

The survey was conducted among students of the university of [name removed for blinded peer review], which consists of nine faculties spread among four main campuses. While one campus is located in the centre of the city, the other three campuses are situated in a more rural environment on the outskirts of the city. All campuses are open to the public and are directly accessible by public roads. This implies that campuses are not only visited by students and staff members but also by inhabitants of the city or tourists. At the time of the study, the university enrolled 21,095 students with a majority of 11,918 (56,5%) female students and 9,177 (43,5%) male students.

[name removed for blinded peer review] consists of approximately 526,000 inhabitants and is, based on its population, the largest city of Belgium. In 2019, the Local Police Department registered 63,495 crimes on the territory of [name removed for blinded peer review]. Theft, disorder, assault and battery and drug-related offenses were the most frequently reported crimes (Federale Politie, 2019). In the vicinity of the four university campuses, the same types of crime were registered most often. Crime rates differed in 2018 from 284 to 1,099 with the highest crime rate measured in the environment of the campus located in the city centre (Lokale Politie Antwerpen, 2019).[1] Unfortunately, no crime rates are available for the university campuses itself.

In the past years, the university of [name removed for blinded peer review] increased its security efforts and invested, among other things, in new buildings with CCTV and access control, strengthened the collaboration with external security services and improved the support system for students who became victim of inappropriate behaviour. In order to implement more evidence-based security measures, this study has the aim to provide more empirical foundations about students' fear of crime on campus.

Procedure and Participants

The current study was conducted among university students of [name removed for blinded peer review]. All students who were enrolled at the university during the spring semester of 2019 were eligible to participate in this study. An online survey was spread among all students of the university ($n = 21{,}095$) from 25 March 2019 until 25 May 2019. With the cooperation of the central administration of the university, every student received an email with a link to the questionnaire, which was developed in Qualtrics. After 10 days, a kindly reminder was sent via email and an announcement was placed on the faculty's internal website. Students voluntarily and anonymously completed the online survey, utilizing self-selection processes.

A total of 1,463 students participated in the study, which yielded a response rate of 7%. The average amount of years that respondents were a student at the university was 2.88 years ($SD = 1.93$, *range* = 1–8), with 65.1% females ($n = 953$) and 34.9% males ($n = 510$). When comparing these results to the total student population, it should be remarked that the two groups differed in terms of gender. Females were overrepresented among the survey participants.

Measurements

The survey consisted of a structured questionnaire with some socio-demographic questions (e.g., gender and years of study) and questions on students' victimization experiences, perceived disorder, risk perception, feelings of anxiety and avoidance behaviours. Table 1 provides an overview of all study variables with their descriptives (mean and SD).

Perceived Social Disorder

Similar to the study of Pauwels and Hardyns (2009) which focuses on communities, respondents were asked how often they noticed some problematic social situations on the campus where they were most present on and in the streets that give direct access to this campus. Five items were measured (e.g., 'people who are using drugs') and responses were made using a five-point Likert scale, ranging from (almost) never (= 1) to (almost) often (= 5). The internal reliability proved to be good ($\alpha = 0.78$).

Perceived Physical Disorder

Again, similar to the study of Pauwels and Hardyns (2009), perceived physical disorder was measured by asking the students were how often they have noticed physical disorder on the campus where they are most present on and in the streets that give access to this campus. The scale consists of three items (e.g., 'visible signs of vandalism (broken windows, doors, …'). Each item was

TABLE 1. Descriptives of the variables included in the study ($n = 1,463$)

	M	SD
Perceived social disorder	1.46	0.79
Item 1 – The presence of tramps, homeless people or beggars	1.84	0.95
Item 2 – People who are using drugs (e.g. weed, hash, …)	1.43	0.76
Item 3 – People who are harassing someone to get money or other things	1.31	0.61
Item 4 – People who are fighting	2.20	1.13
Item 5 – People who are drunk		
Perceived physical disorder	2.49	1.05
Item 1 – Poorly maintained infrastructure (e.g. broken lights, doors, …)	2.21	0.97
Item 2 – Dirty rooms, hallways or other spaces	1.66	0.80
Item 3 – Visible signs of vandalism (e.g. broken windows, graffiti, …)		
Risk perception	2.76	2.14
Item 1 – Verbal abuse	1.46	1.45
Item 2 – Physical abuse	1.97	1.85
Item 3 – Threat with physical abuse, without the threat being executed	1.65	1.26
Item 4 – Stalking	1.85	1.69
Item 5 – Being drugged	2.00	2.15
Item 6 – Cyberbullying		
Feelings of anxiety	1.52	0.79
Item 1 – Verbal abuse	1.32	0.64
Item 2 – Physical abuse	1.32	0.62
Item 3 – Threat with physical abuse, without the threat being executed	1.30	0.64
Item 4 – Stalking	1.24	0.57
Item 5 – Being drugged	1.26	0.59
Item 6 – Cyberbullying		
Avoidance behaviour	1.22	0.56
Item 1 – During the day, I avoid certain places on my campus because I feel unsafe	2.09	1.19
Item 2 – At night, when it is dark, I avoid certain places on my campus because I feel unsafe	1.32	0.74
Item 3 – I avoid following courses late at night because I feel unsafe	1.57	0.95
Item 4 – I make sure that I do not have to walk alone through the hallways of my campus at night because I feel unsafe		
Study years	2.88	1.93

scored on a five-point Likert scale, ranging from (almost) never (= 1) to (almost) often (=5). Reliability analysis indicated that the scale has a Cronbach's alpha of 0.71.

Risk Perception
Based on the study of Ferraro (1996), respondents were asked to give an estimation of the chance that they could become a victim on campus they were most present on or in the direct neighbourhood of this campus within

the next 12 months. The risk perception scale consists of six items (e.g., 'stalking'). For each item, respondents had to indicate a number on a scale from no probability (= 0) to very high probability (= 10). The internal reliability proved to be good ($\alpha = 0.89$).

Feelings of Anxiety

Based on the research of Farall and Gadd (2004), feelings of anxiety was measured by asking respondents about the frequency of their feelings of anxiety for criminal victimization on campus they were most present on or in the direct neighbourhood of this campus in the past 12 months. Six items were used (e.g., 'verbal abuse'). Each item was scored on a five-point Likert-scale, ranging from (almost) never (= 1) to (almost) often (= 5). Reliability analysis indicated the scale has a Cronbach's alpha of 0.86.

Avoidance Behaviour

To measure avoidance behaviour, students were asked to what extent they adapt their behaviour on campus. The scale consists of five self-constructed items (e.g., 'I avoid following courses late at night because I feel unsafe'). Each item was scored on a five-point Likert scale ranging from (almost) never (= 1) to (almost) often (= 5). Reliability analysis showed that the avoidance behaviour scale was reliable ($\alpha = 0.79$).

Direct Victimization

Similar to the studies of Ferraro (1996) and Fisher and Sloan (2003) students were asked about their previous experiences with personal victimization on campus in the past 12 months. Responses were given by indicating 'yes' or 'no' on a selection of six types of crime (e.g., verbal abuse). Furthermore, students had the possibility to indicate 'other' and fill in a criminal offense that was not included in the list above.

Indirect Victimization

To measure the impact of indirect victimization, students were asked if they knew any fellow students who had been a victim of crime on campus in the past 12 months (Ferraro, 1996; Fisher and Sloan, 2003). Similar to the previous question on direct victimization, respondents had to indicate 'yes' or 'no' on a selection of six crimes (e.g., physical abuse) or had the option to fill in another criminal offense.

Data Analysis

To test the hypotheses, SEM was applied to the collected data using Mplus 8.4 to examine the relationships between perceived disorder and the three dimensions of fear of crime (Muthén and Muthén, 2017). The analyses were performed using the following approach. First, a measurement model was built to test whether the observed variables reliably reflected the hypothesized latent variables (i.e., perceived social disorder, perceived physical disorder, risk perception, feelings of anxiety and avoidance behaviour). Thereafter, we estimated a structural model with gender and years of study as covariates. The SEM results were obtained with the maximum likelihood mean adjusted because preliminary tests suggested that avoidance behaviour was a not normally distributed dependent variable.

The model fits of the measurement and path models were evaluated according to several fit indices. Given that the χ^2 is almost always significant and not an adequate test of the model fit (Brown, 2015; Kline, 2016), we have also reported the comparative fit index (CFI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) (Kline, 2016). The CFI ranged from 0 to 1.00, with a cut-off of .95 or higher indicating that the model provided a good fit and .90 indicating that the model provided an adequate fit (Byrne, 2001; Hu and Bentler, 1999). RMSEA values below .05 indicated a good model fit, and values from .06 to .08 indicated an adequate fit (Ponnet, 2014). The SRMR consisted of a standardized summary of the average covariance residuals (Kline, 2016). A relatively good model fit was indicated when the SRMR value was less than .08 (Hu and Bentler, 1999).

4. RESULTS

Table 2 displays the correlations between the research constructs used in the model. All constructs were significantly positive related to each other.

TABLE 2. Correlations between the components of the research model. *p < .01; **p < .001 (n = 1,463)

	1	2	3	4	5	6	7
1 Perceived social disorder	-						
2 Perceived physical disorder	0.331**	-					
3 Risk perception	0.374**	0.272**	-				
4 Feelings of anxiety	0.346**	0.204**	0.529**	-			
5 Avoidance behaviour	0.189**	0.197**	0.412**	0.455**	-		
6 Direct victimization	0.208**	0.079*	0.193**	0.213**	0.138**	-	
7 Indirect victimization	0.273**	0.128**	0.180**	0.224**	0.099*	0.311**	-

The measurement model provided an adequate fit for the data χ^2 (236) = 1097.55, p < .001; CFI = .918, RMSEA = .051, CI [.048, .054], SRMR = .056. All factor loadings were significant and above .56. The results of the structural model are presented in Figure 2. The results of the fit statistics indicated an adequate model fit: χ^2(318) = 1390.81, p < .001; CFI = .91, RMSEA = .050, CI [.047, .052] and SRMR = .052.

Our analyses revealed that feelings of anxiety, risk perception, perceived social and physical disorder together with the covariates, explained 35.5% of the variance in avoidance behaviour. In addition, risk perception, perceived social and physical disorder together with the covariates, accounted for 29.6% of the variance in feelings of anxiety. Perceived social and physical disorder and the covariates accounted for 19.3% of the variance in students' risk perception.

The strongest predictors of students' avoidance behaviour were feelings of anxiety (β = .24, p < .001) and risk perception (β = .19, p < .001), followed by perceived physical disorder (β = .09, p < .01). Unexpectedly, perceived social disorder (β = .05, p = .20) was not significantly related to avoidance behaviour. These results indicate that students who perceive more physical disorder, have a higher estimate of the risk of victimization, experience more feelings of anxiety and show more avoidance behaviour. Students who perceive more social disorder at their campus or in the direct neighbourhood of the campus do not adapt their behaviour.

Furthermore, the strongest determinants of students' feelings of anxiety were risk perception (β = .37, p < .001) and perceived social disorder (β = .25, p < .001). This indicates that students who perceive more social disorder, have a higher risk perception and experience more feelings of anxiety. Unexpectedly, no significant direct relationship was found between perceived physical disorder (β = 0.003, p = 0.93) and feelings of anxiety, which indicates that students who perceive more physical disorder do not experience higher levels of anxiety.

With regard to the gender and years of study, we found a significant relationship between gender and avoidance behaviour (β = .37, p < .001), indicating that
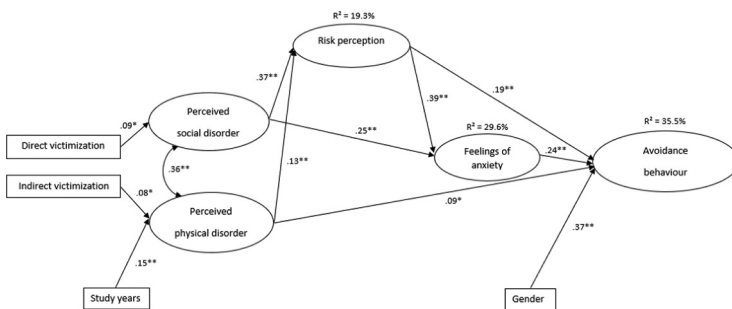

Figure 2. Full model of determinants of the three dimensions of fear of crime. Note: All reported coefficients are standardized values, adjusted for the influence of covariates. Only significant associations are presented. *p < .01; **p < .001

female students show significantly more avoidance behaviour on campus in comparison to their male counterparts. Unexpectedly, no significant associations were found between gender and risk perception or feelings of anxiety. Furthermore, years of study was significantly related to perceived physical disorder ($\beta = .15$, $p < .001$), indicating that students who have been studying at the university for a longer time perceive more physical disorder on campus and in the direct neighbourhood of the campus in comparison to students who have been a student at the university for a shorter time. Years of study was not significantly associated with any other study variables.

5. DISCUSSION

Crime and victimization on campuses is currently widely recognized not only as an educational concern but also as a social issue. One of the effects of crime and victimization is fear, which can have a considerable impact on the recruitment and the overall quality of the learning environment (Fisher *et al.*, 2010; Fisher and Sloan, 2013). To date, research on the determinants of fear of crime mostly focused on demographic gender differences and other personal characteristics, while limited efforts have been applied to understanding the influence of environmental cues on students' fear of crime. The present study has attempted to fill this void by examining the influence of perceived social and physical disorder on the three dimensions of fear of crime.

First of all, our findings suggest that a higher perception of physical disorder in combination with a higher estimate of the risk of victimization and higher levels of anxiety lead to more avoidance behaviour on campus. While we expected that both perceived physical and social disorder would have an impact on students' behaviour, no significant association was found between the perception of social disorder and students' avoidance behaviour. This indicates that students adapt their behaviour when they notice physical disorder on campus, such as poorly maintained infrastructure or visible signs of vandalism. Secondly, the study suggests that a higher perception of social disorder in combination with a higher estimate of the risk of victimization increases students' feelings of anxiety. This indicates that students' feelings of anxiety strengthen when they notice signs of social disorder in their environment, such as drunk people or people fighting. No significant relationship was found between perceived physical disorder and feelings of anxiety.

Secondly, two conclusions can be made regarding the role of the control variables which can also be important for policy strategies. First, our study suggest that female students show more avoidance behaviour in comparison to their male counterparts. Also, previous studies have indicated that more female students adapt their behaviour, but that this is caused by the fact that they experience higher levels of anxiety and estimated a higher risk of victimization. Unexpectedly, no relation between gender and risk perception and feelings of anxiety was found in our study. This indicates that both female and male students estimate similar levels of risk

perception and experience similar levels of anxiety, while mostly female students adapt their behaviour to these cognitive and emotional experiences. Secondly, our study suggests that the amount of years that a student studies at the university has an impact on his or her perceived physical disorder. While previous research showed that older students or students in a higher grade experienced more feelings of anxiety, this finding cannot be confirmed based on our results.

6. Conclusions and Recommendations

The above findings offer several implications for the different stakeholders who are involved in campus security. First of all, it is indicated that fixing 'the broken window' is important to reduce students' feelings of anxiety and their responding behaviours. In order to reduce social and physical disorder, many scholars have sought solutions in the neighbourhood setting and have suggested collective efficacy (Scarborough *et al.*, 2010). Collective efficacy consists of individuals who have a strong tie to the community or neighbourhood. Research conducted in communities has shown that residents of neighbourhoods with strong social cohesion and collective efficacy are more likely to report lower levels of fear (Hardyns *et al.*, 2018; Scarborough *et al.*, 2010). On college campuses every year incoming students start their academic career while a large group of older students leave the university and its campus environment. Due to these transitions, forming strong social ties in neighbourhoods is not totally comparable with creating collective efficacy on campus. However, many colleges and universities have student associations, sport teams or other initiatives that unite students which also gives them a platform where they can report concerns about their safety on campus.

On the other hand, social bonds do not necessarily have to be formed in order for problems to be identified and addressed. Visible improvements in the campus area, such as planting vegetation, implementing garbage cans or the installing extra lighting could reduce social and physical disorder (Woodward *et al.*, 2016). Previous studies have showed that proper landscaping, visibility and clean and well-kept areas increased students' perceptions of safety on campus (Fernandez, 2005). Additionally, lower levels of crime prevention through environmental design (CPTED) have found to be associated with higher levels of fear among college students (Cozens and Sun, 2018). Therefore, security stakeholders must be aware of the opportunities of CPTED measures to decrease students' fear of crime. Furthermore, awareness campaigns can be used to encourage students and staff to keep the buildings of the university clean or to report broken infrastructure or dirty classrooms. Making students more aware of crime victimization on campus and its determinants has already been suggested by many scholars (Jennings *et al.*, 2007; Robinson and Roh, 2013; Sani *et al.*, 2019). Moreover, awareness campaigns have the advantage that they

can often be easily implemented, and they are rather inexpensive. Finally, close cooperation with the police department and local authorities is recommended in order to reduce the visible signs of disorder in the neighbourhood of the campus. In our study, we asked students about their perception of disorder both on campus and in the direct neighbourhood of the campus. This implies that not only the campus buildings but also the areas around the campus may generate fear of crime. Despite the fact that areas bordering a campus may actually considered no property of the university, students may have to travel through these areas on their way to and from campus. Therefore, it should be the responsibility of the university to initiate and maintain partnerships with local authorities.

7. LIMITATIONS

Although we have uncovered a number of interesting findings, this study is not without limitations. First, the data were obtained cross-sectional, which implies that it is not possible to explore the long-term effect of the determinants on students' fear of crime. For instance, Hardyns *et al.* (2018) observed that disorder might influence feelings of fear over a period of time. Other studies are needed in order to examine whether the determinants of students' fear of crime varies across time. Furthermore, students were asked about their risk perception, feelings of anxiety and avoidance behaviour in the past 12 months. While we limited this time frame on purpose, memory bias may have influenced our findings. Moreover, as all data were collected through self-reports, socially desirable answers could be given.

Secondly, the participants of the current study represent a self-selected sample of the targeted population, which is a non-random selection. Unfortunately, the researchers could not control for the self-selection process that comes with this voluntary, online survey. This implies that the results cannot be extrapolated in any statistically of mathematically meaningful way to the entire student population. Therefore, it is unknown how the participants compare to other students who did not fill in the questionnaire. Although previous research showed that self-selection does not necessarily bias the results of surveys used in campus studies (Brown *et al.*, 2014; Rosenthal and Freyd, 2018), this limitation should be considered. Additionally, while a 10% response rate for online surveys is generally considered acceptable, the current study is characterized by a relatively low response rate. Reasons for this low response date could be factors such as the over-surveying of students at the end of the academic year, students' perception that the topic is irrelevant or students' lack of time. Although the current study consists of an adequate sample, this limitation should be kept in mind when interpreting the results.

Thirdly, as our data were obtained from students from one university, caution is needed to generalize the results to other universities. The university's structure and security policy can have a substantial impact on the results. In the current study, a survey was conducted at a university which consists of four main campuses that are

characterized by an open structure and have direct access to the public space. However, not all university campuses have these open-access character. Consider for instance college campuses where all buildings and student accommodation are located on one central location, well demarcated from public space. The university's characteristics often dependent on the country where it is located. Scholars already stated that the conclusions from the large body of scientific research on students' fear of crime on American campuses cannot be extrapolated to European universities (Sani *et al*., 2019). This indicates that caution is needed when adapting the conclusions from the current study to universities within another country or continent. To date, studies on fear of crime among students of European universities are rather scare. Finally, one should be careful to generalize the conclusions to the entire university population, which also include other groups such as faculty or professors. Previous research has stated that college students have unique characteristics which may not necessarily coincide with those of the larger community (Lee and Hilinski-Rosick, 2012). Therefore, it is important that further research gathers data from other college campuses and different groups of the university community. The findings and recommendations of the current study should be interpreted with caution given the generalizability concerns.

Despite these limitations, this study adds a valuable contribution to the research on fear of crime among college students. To date, there is a lack of current research on the impact of environmental cues on fear of crime on campus in general and more specific in a non-American context. Further research needs to be completed to examine whether the physical environment of the campus and the surrounding areas play any role in students' risk perceptions, feelings of anxiety and avoidance behaviour on campus.

8 NOTES

[1]   While we found crime rates for the year 2019 on city level, unfortunately no crime rates of 2019 were available for the level of the neighborhood. Therefore, the most recent police statistics of 2018 were consulted.

9 DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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